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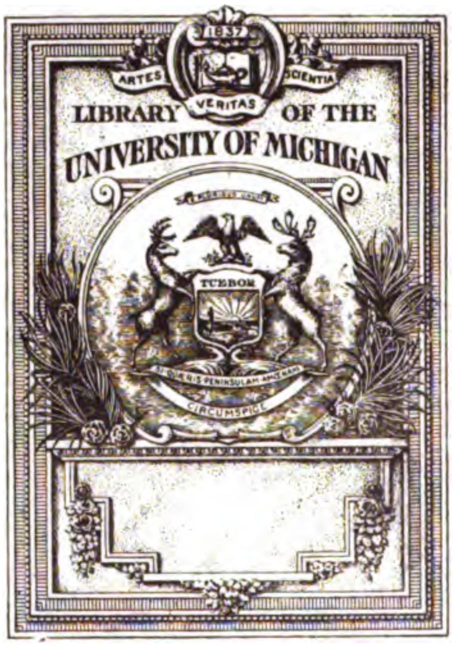
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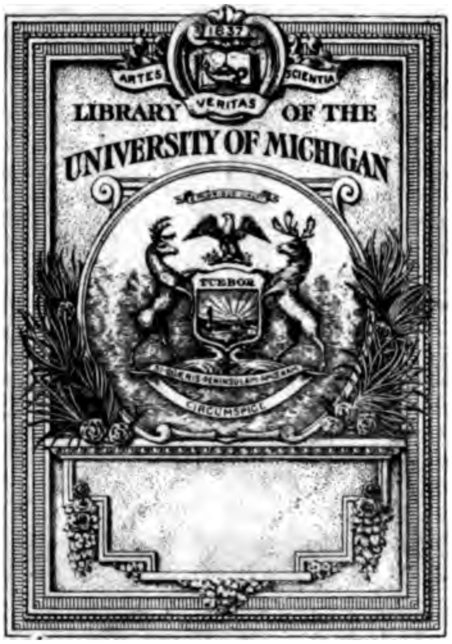

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THE

AMERICAN EPHEMERIS

AND

NAUTICAL ALMANAC

FOR THE YEAR

1919

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Note.—Those whose names are printed in italics devote only a small portion of their time to work of the Nautical Almanac Office.

July, 1916.

PREFACE.

This volume of the *American Ephemeris and Nautical Almanac* was prepared under the immediate supervision of Professor W. S. Eichelberger, U. S. N., the Director. The character of the matter herein contained and its arrangement are the same as in the immediately preceding volumes.

This is the fourth volume to be issued under the international agreement resulting from the *Congrès International des Éphémérides Astronomiques* held at Paris in October, 1911.

The naval appropriation bill approved August 22, 1912, contained the following:

> The Secretary of the Navy is hereby authorized to arrange for the exchange of data with such foreign almanac offices as he may from time to time deem desirable, with a view to reducing the amount of duplication of work in preparing the different national nautical and astronomical almanacs and increasing the total data which may be of use to navigators and astronomers available for publication in the American Ephemeris and Nautical Almanac: *Provided,* That any such arrangement shall be terminable on one year's notice: *Provided further,* That the work of the Nautical Almanac Office during the continuance of any such arrangement shall be conducted so that in case of emergency the entire portion of the work intended for the use of navigators may be computed by the force employed by that office, and without any foreign cooperation whatsoever: *Provided further,* That any employee of the Nautical Almanac Office who may be authorized in any annual appropriation bill and whose services in whole or in part can be spared from the duty of preparing for publication the annual volumes of the American Ephemeris and Nautical Almanac may be employed by said office in the duty of improving the tables of the planets, moon, and stars, to be used in preparing for publication the annual volumes of the office: *Provided further,* That section four hundred and thirty-five, Revised Statutes, is hereby repealed.

The Greenwich ephemerides of the Sun, Venus, Mars, Jupiter, Saturn, Uranus, and Neptune, and the right ascension and declination of the Moon for each hour were furnished by the office of the British *Nautical Almanac.*

The Greenwich ephemeris of Mercury and the apparent places for Greenwich transit of 518 ten-day stars were furnished by the office of the *Berliner Jahrbuch.*

The conjunctions, phenomena, and configurations of Jupiter's satellites I–IV and the apparent places for Greenwich transit of 38 circumpolar stars were furnished by the office of the *Connaissance des Temps.*

The longitude, latitude, and horizontal parallax of the Moon, and the apparent places for Greenwich transit of 121 ten-day stars were furnished by the office of the *Almanaque Nautico.*

The apparent places for Greenwich transit of 137 ten-day stars were furnished by the office of the *Annuario Astronomico di Torino.*

In accordance with the recommendations of the *Congrès International des Éphémérides Astronomiques*, most of the material furnished from abroad is based upon tables prepared in the American Nautical Almanac Office. In the Introduction are mentioned the various tables upon which the different ephemerides are based.

The following computations were made by the American Nautical Almanac Office:

In Part I, all the hourly and daily variations for the quantities furnished from abroad except in the case of the right ascension and declination of the Moon.

In Part II, the quantities used in computing the apparent places of the stars from their mean places; the mean place list; the interpolation of the apparent places of 814 stars from transit at Greenwich to transit at Washington; the apparent places of 11 stars; the interpolation of the ephemerides of the Sun, Moon, and planets from Greenwich noon to transit at Washington; the stellar magnitudes of the planets.

In Part III, the data relating to the eclipses of the Sun and Moon; the data relating to the occulations of stars and planets by the Moon; the ephemerides for physical observations of the Sun, Moon, Mars, and Jupiter; the elements of the illuminated disks of Mercury and Venus; the stellar magnitudes of the planets; the data concerning the satellites of Saturn, Uranus, Neptune, and the fifth, sixth, and seventh satellites of Jupiter; the diagrams of all the satellite orbits; the list of phenomena; the list of observatories with their geographical coordinates; the tables for the determination of latitude and azimuth from observations of Polaris; and the tables for the determination of the time of the rising and setting of the Sun and Moon.

All computations made in the American Nautical Almanac Office and those received from the other offices were subjected to checks to insure absence of errors.

J. A. HOOGEWERFF,
Captain, U. S. Navy,
Superintendent Naval Observatory.

U. S. NAVAL OBSERVATORY, *July, 1916.*

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ERRATA.

The American Ephemeris, 1916.

Page.					
231	Footnote, 32 H. Camelop.	*for*	5^{m}, $19''.8$ s. pr.	*read*	$5^{m}.8$, $21''.6$ n. pr.

The American Ephemeris, 1917.

231	Footnote, 32 H Camelop.	*for*	5^{m}, $19''.8$ s. pr.	*read*	$5^{m}.8$, $21''.6$ n. pr.

The American Ephemeris, 1918.

149	Dec. 32, Helioc. Latitude	*for*	37.0	*read*	36.7
231	Footnote, 32 H. Camelop.	*for*	5^{m}, $19''.8$ s. pr.	*read*	$5^{m}.8$, $21''.6$ n. pr
730	Lines 2, 4, and 6, of computation of magnitude	*for*	ξ	*read*	ζ
734	Line 20 of computation	*for*	sin d	*read*	sin δ

INTRODUCTION.

The ephemeris of the Sun is constructed from **Newcomb's** *Tables of the Sun, Astronomical Papers of the American Ephemeris*, Vol. VI, part 1.

The adopted value of the mean equatorial horizontal parallax of the Sun is 8″.80, *Paris Conference, May, 1896.*

The Sun's rectangular equatorial coordinates are computed from the longitudes and latitudes by the following formulæ:

$$X = R \cos \lambda$$
$$Y = R \sin \lambda \cos \omega - 19.3\, R\, \beta$$
$$Z = R \sin \lambda \sin \omega + 44.5\, R\, \beta$$

The reductions to mean equinox are computed by the formulæ—

$$\Delta X = +\, Y \sec \omega\, \Delta\lambda \sin 1''$$
$$\Delta Y = -X \cos \omega\, \Delta\lambda \sin 1'' + Z \Delta\omega \sin 1'' + 9.1\, \tau R \sin (\lambda + 6^\circ)$$
$$\Delta Z = -X \sin \omega\, \Delta\lambda \sin 1'' - Y \Delta\omega \sin 1'' - 21.0\, \tau R \sin (\lambda + 6^\circ)$$

where the numerical coefficients are in units of the seventh place of decimals and

R = the Sun's distance from the Earth.
λ = the Sun's true longitude,
β = the Sun's true latitude, expressed in seconds of arc,
ω = the obliquity of the ecliptic,
$\Delta\lambda$ = the reduction of longitude for precession and nutation from the beginning of the Besselian fictitious year,
$\Delta\omega$ = the reduction of the mean to the apparent obliquity,
τ = the fraction of the year since the beginning of the Besselian fictitious year.

The longitude, latitude, and parallax of the Moon are derived from **Hansen's** *Tables de la Lune* (London, 1857), the mean longitude being corrected as in previous years, beginning with the volume for the year 1883. The statement concerning these corrections which is contained in the volumes from 1883 to 1911, inclusive, is erroneous, in that they have not been computed strictly in accordance with the formula in **Newcomb's** *Researches on the Motion of the Moon*, part 1, page 268, *Washington Observations*, 1875, Appendix II. That formula is,

$$-1''.14 - 29''.17\, T - 3''.86\, T^2 - V_2 - 0''.09 \sin A - 15''.49 \cos A,$$

while the expression actually used is,

$$-1''.14 - 29''.17\, T - 3''.76\, T^2 - V_2 - 15''.49 \cos A.$$

In these formulæ T is the time in units of 100 years reckoned from 1800.

The ephemerides of Mercury, Venus, and Mars are derived from **Newcomb's** tables of these planets, *Astronomical Papers of the American Ephemeris*. Vol. VI, parts 2, 3, and 4.

The ephemerides of Jupiter and Saturn are derived from the tables constructed in this office by George W. Hill, *Astronomical Papers of the American Ephemeris*, Vol. VII, parts 1 and 2.

The ephemerides of Uranus and Neptune are derived from Newcomb's tables of these planets, *Astronomical Papers of the American Ephemeris*, Vol. VII, parts 3 and 4.

The nutation used in computing the ephemerides of the Sun, Moon, and planets has been taken from Tables XXXII and XXXIII of Newcomb's *Tables of the Sun, Astronomical Papers of the American Ephemeris*, Vol. VI, part 1. The formulæ from which this nutation is computed are as follows, the time interval T being expressed in units of 100 years, reckoned from 1900. See *Tables of the Sun*, page 26.

$$\begin{aligned}\delta\psi = &-(17''.234+0''.017\,\mathrm{T})\sin\text{☊}\\ &+\ 0''.209\sin 2\,\text{☊}\\ &-\ 1''.257\sin 2\,\mathrm{L}\\ &-\ 0''.049\sin(3\,\mathrm{L}+78^{\circ}.7)\\ &+\ 0''.110\sin(\mathrm{L}+75^{\circ}.3)\end{aligned}$$

$$\begin{aligned}\delta\epsilon = &+9''.214\cos\text{☊}\\ &-0''.090\cos 2\,\text{☊}\\ &+0''.546\cos 2\,\mathrm{L}\\ &+0''.021\cos(3\,\mathrm{L}+78^{\circ}.7)\\ &-0''.009\cos(\mathrm{L}-78^{\circ}.7)\end{aligned}$$

The formulæ for the nutation used in computing the Besselian and Independent Star Numbers are as follows:

Terms of Long Period.

$$\begin{aligned}\delta\psi = &-(17.''234+0''.017\,\mathrm{T})\sin\text{☊}\\ &+\ 0''.209\sin 2\,\text{☊}\\ &-\ 1''.272\sin 2\,\mathrm{L}\\ &+\ 0''.126\sin(\mathrm{L}-\Gamma)\\ &-\ 0''.050\sin(3\,\mathrm{L}-\Gamma)\\ &+\ 0''.021\sin(\mathrm{L}+\Gamma)\\ &+\ 0''.012\sin(2\,\mathrm{L}-\text{☊})\end{aligned}$$

$$\begin{aligned}\delta\epsilon = &+(9''.210+0''.0009\,\mathrm{T})\cos\text{☊}\\ &-\ 0''.090\cos 2\,\text{☊}\\ &+\ 0''.551\cos 2\,\mathrm{L}\\ &+\ 0''.022\cos(3\,\mathrm{L}-\Gamma)\\ &-\ 0''.009\cos(\mathrm{L}+\Gamma)\\ &-\ 0''.007\cos(2\,\mathrm{L}-\text{☊})\end{aligned}$$

Terms of Short Period.

$$\begin{aligned}&-0''.204\sin 2\,\text{☾}\\ &+0''.011\sin(\text{☾}+\Gamma')\\ &+0''.068\sin(\text{☾}-\Gamma')\\ &-0''.034\sin(2\,\text{☾}-\text{☊})\\ &-0''.026\sin(3\,\text{☾}-\Gamma')\\ &+0''.015\sin(\text{☾}-2\,\mathrm{L}+\Gamma')\\ &+0''.006\sin 2(\text{☾}-\mathrm{L})\end{aligned}$$

$$\begin{aligned}&+0''.088\cos 2\,\text{☾}\\ &+0''.018\cos(2\,\text{☾}-\text{☊})\\ &+0''.011\cos(3\,\text{☾}-\Gamma')\\ &-0''.005\cos(\text{☾}+\Gamma')\end{aligned}$$

The meaning of the symbols used and the manner in which these latter formulæ have been employed in computing the ephemerides of the stars are explained on pages 200 and 201. The slight discrepancy between the terms in 2 L in these two sets of formulæ is due to the correction of an error in the first set. See *Bulletin Astronomique*, 1898, Vol. XV, page 244.

The list of 825 stars contained in Part II has been selected from Newcomb's *Catalogue of Fundamental Stars, Astronomical Papers of the American Ephemeris*, Vol. VIII, part 2.

In general, the names of the stars are the same as in Newcomb's Suggested List of Fundamental Stars, except that the Flamsteed number has been omitted in all cases where Greek or italic letters are available. In some cases the constellation and number of the uranometries of Heis or Gould have been used. In all such cases, H^1 or the letter G precedes the constellation name, as, for example, 5 H^1. Cassiopeiæ and 38 G. Horologii.

The magnitudes of the stars have, with a few exceptions, been taken from *Annals of the Harvard College Observatory*, Vol. L, 1908.

The spectral classification has been furnished by the Harvard College Observatory. The notation is that of *Annals of Harvard College Observatory*, Vol. LVI.

The mean places, annual variations, and annual proper motions of the stars have been taken from NEWCOMB's Catalogue, except that those of ϵ Hydri, 38 G. Horologii, and π Centauri have been taken from *Veroeffentlichungen des Koeniglichen Astronomischen Rechen-Instituts zu Berlin*, 1907, No. 33.

The values of $\Delta\alpha$ and $\Delta\delta$ which are given for the companions to the stars γ Andromedæ, α^1 Crucis, ζ^1 Ursæ Majoris and 61 Cygni, have been taken from Boss's *Preliminary General Catalogue*, and those for α^2 Geminorum from DOBERCK's elements given in the *Astronomische Nachrichten*, 1904, vol. 166, page 145.

The formulæ for the computation of the Besselian and Independent Star Numbers are given on page 200, the coefficients being those given by NEWCOMB in *Bulletin Astronomique*, 1898, Vol. XV, page 241.

The terms of short period of the nutation, depending on the Moon's mean longitude, have been computed from the formulæ for these terms given above.

The method by which the right ascensions and declinations of the stars interpolated from the 10-day ephemerides are corrected for the effect of these short-period terms is given on page 201.

According to the formulæ on pages 200 and 201 the star constants *a*, *b*, *c*, *d*, *a'*, *b'*, *c'*, *d'* are computed for each star from its mean place at the beginning of the year, but if strict accuracy is required they should be computed from the star's mean place at date, and the following second-order terms should be added to the usual expressions for the reduction from mean to apparent place, namely—

To $\alpha-\alpha_0$

$$\begin{array}{l}
\left.\begin{array}{l}+0\overset{s}{.}000\,003\,\tau^2\sin\alpha\\ -0.000\,149\,\tau^2\cos\alpha\end{array}\right\}\tan\delta\\
\left.\begin{array}{l}-0.000\,0650\,\tau^2\sin 2\alpha\\ +0.000\,0103\sin 2\Omega\cos 2\alpha\\ -0.000\,0107\cos 2\Omega\sin 2\alpha\end{array}\right\}\tan^2\delta\\
\left.\begin{array}{l}+0.000\,0620\sin 2\odot\cos 2\alpha\\ -0.000\,0622\cos 2\odot\sin 2\alpha\end{array}\right\}\sec^2\delta\\
\left.\begin{array}{l}+0.000\,0513\sin(\odot+\Omega)\cos 2\alpha\\ -0.000\,0507\cos(\odot+\Omega)\sin 2\alpha\\ +0.000\,0097\sin(\odot-\Omega)\cos 2\alpha\\ -0.000\,0053\cos(\odot-\Omega)\sin 2\alpha\end{array}\right\}\tan\delta\sec\delta
\end{array}$$

To $\delta-\delta_0$

$$\begin{array}{l}
\left.\begin{array}{l}+0\overset{''}{.}000\,975\,\tau^2\sin^2\alpha\\ -0.000\,023\cos 2\Omega\\ -0.000\,080\cos 2\Omega\cos 2\alpha\\ -0.000\,077\sin 2\Omega\sin 2\alpha\\ +0.000\,040\cos 2\odot\\ -0.000\,467\cos 2\odot\cos 2\alpha\\ -0.000\,465\sin 2\odot\sin 2\alpha\end{array}\right\}\tan\delta\\
\left.\begin{array}{l}-0.000\,039\cos(\odot+\Omega)\\ -0.000\,380\cos(\odot+\Omega)\cos 2\alpha\\ -0.000\,385\sin(\odot+\Omega)\sin 2\alpha\\ -0.000\,380\cos(\odot-\Omega)\\ -0.000\,040\cos(\odot-\Omega)\cos 2\alpha\\ -0.000\,072\sin(\odot-\Omega)\sin 2\alpha\end{array}\right\}\sin\delta\tan\delta
\end{array}$$

These terms are negligible for stars whose declination is numerically less than 80°, but in computing the apparent places given in the American Ephemeris they have been applied whenever sensible.

The *apparent* places of seven stars have been corrected for the effect of annual parallax. These stars, with the adopted values of the annual parallax, are—

	''		''
τ Ceti	0. 31	α Centauri	0. 75
ϵ Eridani	0. 32	α Aquilæ (Altair)	0. 23
α Canis Majoris (Sirius). .	0. 38	61 Cygni	0. 30
α Canis Minoris (Procyon).	0. 33		

The *apparent* places of α Canis Majoris (Sirius), α Canis Minoris (Procyon), and α^2 Centauri have been corrected for the effect of orbital motion. AUWERS's elements were used for Sirius and Procyon, and SEE's elements for α^2 Centauri. The values of these corrections are given on pages 98 and 99 of *Veroeffentlichungen des Koeniglichen Astronomischen Rechen-Instituts zu Berlin*, 1907, No. 33, but those for Sirius and Procyon need an additional correction to refer them to the center of the orbit before they are applicable to the mean places taken from NEWCOMB's Fundamental Catalogue. These additional corrections for Sirius and Procyon were omitted in the *Star List of the American Ephemeris* [*Supplement to the American Ephemeris and Nautical Almanac*] for 1910 and 1911, and in the *American Ephemeris and Nautical Almanac* for 1912 and 1913. The values of the corrections for the three stars are—

	Sirius.		Procyon.		α^2 Centauri.	
	1919.0	1920.0	1919.0	1920.0	1919.0	1920.0
$\Delta\alpha$	$-0^s.143$	$-0^s.141$	$-0^s.057$	$-0^s.051$	$+0^s.620$	$+0^s.605$
$\Delta\delta$	$-0''.84$	$-0''.96$	$+0''.31$	$+0''.43$	$+5''.41$	$+5''.10$

These corrections have not been applied to the mean places as published in this volume.

The stars occulted by the Moon have been selected from the *Catalogue of Zodiacal Stars* contained in Vol. VIII, part 3, *Astronomical Papers of the American Ephemeris*, and the mean places have been derived from the same catalogue.

In Part III the elements of eclipses of the Sun and occultations of stars by the Moon are given in accordance with BESSEL's method, the special forms employed being a modification of those developed in CHAUVENET's *Spherical and Practical Astronomy*.

In the computation of the elements of eclipses, the following corrections to the longitude, latitude, and parallax of the Moon, deduced by NEWCOMB from recent observations of occultations of stars by the Moon, *Astronomical Papers of the American Ephemeris*, Vol. IX, part 1, have been applied. These corrections have been assumed in each case to be constant during the eclipse.

G. M. T. 1919		δv	δb	$\delta \pi$
		$''$	$''$	$''$
May 29^d	1^h	+6.8	+1.3	+0.49
Nov. 7	12	+6.0	+1.6	+0.50
Nov. 22	3	+5.4	−0.1	+0.40

The elongations of the satellites of Mars are derived from elements given by H. STRUVE in *Sitzungsberichte der Königlich Preussischen Akademie der Wissenschaften*, 1911, page 1073.

The conjunctions and phenomena of Jupiter's four brighter satellites are derived from SAMPSON's tables. The configurations are derived from a continuation of DAMOISEAU's tables by M. POTTIER.

The elongations of the Vth satellite of Jupiter are derived from unpublished elements deduced from the observations of BARNARD.

The differential coordinates of Jupiter's VIth and VIIth satellites are derived from elements and tables given in *Lick Observatory Bulletin*, 1906, Vol. IV, No. 112, and in *Astronomische Nachrichten*, 1907, Vol. 174, page 359, respectively.

The positions of the rings and the elongations and conjunctions of the satellites of Saturn are derived from elements given by H. STRUVE in *Observations de Poulkova*, Supplement 1, St. Petersburg, 1888; *Publications de Poulkovo*, Second Series, Vol. XI, St. Petersburg, 1898; with corrections communicated by H. STRUVE to the *Berliner Jahrbuch*. The differential coordinates of Phœbe are derived from elements and tables given in *Annals of Harvard College Observatory*, 1905, Vol. LIII, No. VI.

The apparent outer dimensions (*a* and *b*) of the rings of Saturn are also according to STRUVE; the relative dimensions of the rings are computed from BESSEL's data, except those for the dusky ring, which are based on the observations of various astronomers.

The elongations of Ariel and Umbriel, the inner satellites of Uranus, are derived from the data of NEWCOMB's *Uranian and Neptunian Systems, Washington Observations*, 1873, Appendix I. The elongations of Titania and Oberon, the outer satellites of Uranus, are derived from elements given by H. STRUVE in *Abhandlungen der K. Preussischen Akademie der Wissenschaften*, 1912.

The elongations of the satellite of Neptune are derived from elements given by A. HALL in the *Astronomical Journal*, 1898, Vol. XIX, page 65.

The adopted apparent semidiameter of the Sun at the Earth's mean distances is 16′ 1″.50, while in the computation of eclipses the value given by AUWERS in the *Astronomische Nachrichten*, 1891, Vol. 128, page 367, is employed, viz., 15′ 59″.63.

In the computation of the ephemeris for physical observations of the Sun the following elements by CARRINGTON have been used:

Inclination of the Sun's equator to the ecliptic	7° 15′
Longitude of the ascending node of the Sun's equator on the ecliptic	$73° 40' + 50''.25\,(t-1850)$
Sidereal period of rotation (mean solar days)	$25^{d}.38$

The apparent semidiameter of the Moon is computed from the Moon's equatorial horizontal parallax, π, by the formula,

$$S = 0.272\,506\,\pi + 1''.50$$

where the constant 0.272 506 is based on data from occultations given by J. PETERS in the *Astronomische Nachrichten*, 1895, Vol. 138, page 147; and the constant 1″.50 is added to cover the average effect of irradiation.

The value of the Moon's semidiameter employed in the computation of eclipses is computed from the formula,

$$\sin S = 0.272\,274 \sin \pi$$

In the computation of the ephemeris for physical observations of the Moon, the following notation and formulæ have been used, the value of I and the formulæ for physical libration being those given by F. HAYN in *Abhandlungen der K. Sächsischen Gesell. der Wissenschaften*, Vols. 29 and 30, 1904, 1907:

I = the inclination of the Moon's mean equator to the ecliptic (= 1° 32′.1),

Ω = the longitude of the ascending node of the Moon's orbit, or the longitude of the descending node of the Moon's mean equator,

C = the angle at the center of the Moon's disk made by a lunar meridian with the circle of declination, counted from north to east,

$\lambda, \beta, \alpha, \delta$ = the geocentric longitude, latitude, right ascension, and declination of the Moon,

i = the inclination of the Moon's mean equator to the Earth's true equator,
Δ = the distance on the Moon's mean equator from its ascending node on the Earth's true equator to its ascending node on the ecliptic,
$\text{☊}'$ = the distance along the Earth's true equator from the true equinox to the ascending node of the Moon's mean equator,
☾ = the Moon's mean longitude, referred to the mean equinox,
g' = the Earth's mean anomaly,
g = the Moon's mean anomaly,
ω = the angular distance of the perigee of the Moon's orbit from its ascending node on the ecliptic,
b, l = the optical librations in latitude and longitude, respectively,
δb, δl = the physical librations in latitude and longitude, respectively,
$b+\delta b$ = the Moon's geocentric libration in latitude = the Earth's selenographic latitude,
$l+\delta l$ = the Moon's geocentric libration in longitude = the Earth's selenographic longitude,
δC = the physical libration of C,

$$\mu=-0'.617\sin 2\,(\text{☊}-\lambda),$$
$$A=\sin I\cos\,(\text{☊}-\lambda),$$
$$\tan B=\tan I\sin\,(\text{☊}-\lambda),$$
$$\lambda'=\lambda+\mu+Ab,$$
$$b=B-\beta,$$
$$l=\lambda'-\text{☾},$$
$$\sin C'=\sin i\,\frac{\cos\,(\lambda'+\Delta-\text{☊})}{\cos\delta}=-\sin i\,\frac{\cos\,(\alpha-\text{☊}')}{\cos b},$$
$$\delta b=+108''\sin\,(\omega+l)+37''\sin\,(\omega-l)-11''\sin\,(g+\omega-l),$$
$$\delta l=+12''\sin g-59''\sin g'-18''\sin 2\omega,$$
$$\qquad-[108''\cos\,(\omega+l)-37''\cos\,(\omega-l)+11''\cos\,(g+\omega-l)]\tan b,$$
$$\delta C=-[108''\cos\,(\omega+l)-37''\cos\,(\omega-l)+11''\cos\,(g+\omega-l)]\sec b,$$
$$C=C'+\delta C.$$

The Sun's selenographic latitude and longitude have been computed from formulæ the same as those given above except that the heliocentric coordinates of the Moon have been substituted for the geocentric coordinates.

The following elements have been used in computing the ephemerides for physical observations of the planets Mars and Jupiter:

Position of north pole of Mars		$\alpha=21^h\ 10^m\ 0^s+1^s.565(t-1905)$ $\delta=54^\circ\ 30'\ 0''+12''.60(t-1905)$
Position of north pole of Jupiter . . .		$\alpha=17^h\ 52^m\ 0^s.84+0^s.247(t-1910)$ $\delta=64^\circ\ 33'\ 34''.6-0''.60(t-1910)$
Rotation period of Mars		$24^h\ 37^m\ 22^s.65$
Rotation period of Jupiter	System I.	$9^h\ 50^m\ 30^s.004$
	System II.	$9^h\ 55^m\ 40^s.632$
Longitude of Central Meridian of Mars, May 15, 1897, Greenwich Mean Noon		52°.01
Longitude of Central Meridian of Jupiter (System I.), July 14, 1897, Greenwich Mean Noon		47°.31
Longitude of Central Meridian of Jupiter (System II.), July 14, 1897, Greenwich Mean Noon		96°.58

The position of the north pole of Mars is as given by LOWELL and CROMMELIN (see *Monthly Notices R. A. S.*, 1905, Vol. 66, page 56), while that of the north pole of Jupiter has been deduced from the position given by DAMOISEAU for 1750 (see *Tables Écliptiques des Satellites de Jupiter*, page (1)). The rotation periods of Mars and of Jupiter and the longitudes of the central meridians are according to MARTH (see *Monthly Notices R. A. S.*, 1896, Vol. 56, pages 395–403 and 517–524). The longitude of the Great Red Spot and the time of its transit across the Central Meridian given in the volumes for 1913 and 1914 have been replaced by those of System II. of Marth. This change has been made in view of the following facts: The Paris Conference of October, 1911, assigned to the office of the American Ephemeris and Nautical Almanac the preparation of the ephemerides for the physical observations of the planets; a general desire exists that the use of System II. of Marth should not be discontinued; and the position of the Great Red Spot during the opposition of 1912 was about 70° from the place predicted from the elements adopted in the *American Ephemeris and Nautical Almanac* for 1913.

The adopted semidiameters of the planets, with the authority for each, are given on page xvii. Their stellar magnitudes have been computed from formulæ given by G. Mueller in *Publicationen des Astrophysikalischen Observatoriums zu Potsdam*, 1893, Vol. 8, page 366.

In the list of observatories the authority for the various positions is given in each case. The latitudes given are in most cases astronomical. In some instances they have been determined by geodetic triangulation from other points. The reductions from geographic to geocentric latitude, $\varphi' - \varphi$, and the distance from the center of the earth, ρ, are computed from the formulæ on page xvi, using the flattening $\frac{1}{297}$ obtained by John F. Hayford in *Supplementary Investigation in 1909 of the Figure of the Earth and Isostasy*, U. S. Coast and Geodetic Survey, 1910, and adopted by the *Paris Conference*, October, 1911.

ANNIVERSARIES AND FESTIVALS, 1919.

New Year's Day	Wednesday,	Jan.	1.
Epiphany	Monday,	Jan.	6.
Lincoln's Birthday	Wednesday,	Feb.	12.
Septuagesima Sunday	Sunday,	Feb.	16.
Washington's Birthday	Saturday,	Feb.	22.
Quinquagesima (Shrove Sunday)	Sunday,	Mar.	2.
Ash Wednesday	Wednesday,	Mar.	5.
Palm Sunday	Sunday,	Apr.	13.
First Day of Passover	Tuesday,	Apr.	15.
Good Friday	Friday,	Apr.	18.
Easter Sunday	Sunday,	Apr.	20.
Rogation Sunday	Sunday,	May	25.
Ascension Day (Holy Thursday)	Thursday,	May	29.
Memorial Day	Friday,	May	30.
Hebrew Pentecost (Shebuoth)	Wednesday,	June	4.
Pentecost (Whit Sunday)	Sunday,	June	8.
Trinity Sunday	Sunday,	June	15.
Corpus Christi	Thursday,	June	19.
Independence Day	Friday,	July	4.
Labor Day	Monday,	Sept.	1.
Hebrew New Year (Rosh Hashanah)	Thursday,	Sept.	25.
Day of Atonement (Yom Kippur)	Saturday,	Oct.	4.
First Day of Tabernacle (Sucoth)	Thursday,	Oct.	9.
Columbus Day	Sunday,	Oct.	12.
Election Day (in certain States)	Tuesday,	Nov.	4.
Thanksgiving Day	Thursday,	Nov.	27.
First Sunday in Advent	Sunday,	Nov.	30.
Christmas Day	Thursday,	Dec.	25.

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

The year 1919 of the Christian era comprises the latter part of the 143d and the beginning of the 144th year of the independence of the United States of America, and corresponds to the year 6632 of the Julian period.

Of the peoples using the Christian era some employ the Gregorian calendar and some the Julian. January 1, 1919, Julian calendar, corresponds to January 14, 1919, Gregorian calendar.

The year 7428 of the Byzantine era begins on September 1, 1919, Julian calendar.

The year 5680 of the Jewish era begins at sunset on September 24, 1919, Gregorian calendar.

The year 2672 since the foundation of Rome, according to VARRO, begins on January 1, 1919, Julian calendar.

The year 2668 of the era of NABONASSAR begins on May 1, 1919, Julian calendar.

The year 2579 of the Japanese era, being the 8th year of the period Taisho, begins on January 1, 1919, Gregorian calendar.

The year 2231 of the Grecian era, or the era of the SELEUCIDÆ, begins in the present-day usage of the Syrians on September 1, 1919, or on October 1, 1919, Julian calendar, according to different sects; but in the ancient usage of Damascus and Arabia Petræa the year began with the vernal equinox.

The year 1636 of the era of DIOCLETIAN begins on August 30, 1919, Julian calendar.

The year 1338 of the Mohammedan era, or the era of the Hegira, begins at sunset on September 25, 1919, Gregorian calendar.

2 421 960 is the Julian day number of January 1, 1919, Gregorian calendar.

CHRONOLOGICAL CYCLES.

Dominical Letter	E	Solar Cycle	24
Epact	29	Roman Indiction	2
Lunar Cycle or Golden Number	1	Julian Period	6632

ASTRONOMICAL CONSTANTS.

Solar Parallax	$8''.80$	Paris Conference.
Constant of Nutation	9.21	
Constant of Aberration	20.47	
General Precession	$50''.2564+0''.000\ 222(t-1900)$	Newcomb.
Obliquity of the Ecliptic	$23^\circ\ 27'\ 8''.26-0''.4684(t-1900)$	
Equatorial Horizontal Parallax of the Moon	$57'\ 2''.63$*	(Newcomb).

Mean distance Earth to Moon 384 411 kilometers = 238 862 statute miles or 60.2678 radii.

Mean distance Earth to Sun 149 504 201 kilometers = 92 897 416 statute miles.

Velocity of light 299 860 kilometers = 186 324 statute miles per second (Newcomb and Michelson).

Light travels unit distance in $498^s.580$.

Gaussian Gravitation Constant, †$k=0.017\ 202\ 099=3\ 548''.187\ 61$.

Acceleration in one second due to gravity,	$g=\overset{m}{9}.8060-\overset{m}{0}.0260\cos 2\varphi-\frac{2h}{R}g$.‡	Helmert.
Length of seconds pendulum,	$l=\overset{m}{0}.993\ 549-\overset{m}{0}.002\ 631\cos 2\varphi-\frac{2h}{R}l$. ‡	

Length of the year:

Tropical (ordinary)	$\overset{d}{365}.242\ 198\ 79-\overset{d}{0}.000\ 000\ 0614\ (t-1900)$	Newcomb.
Sidereal	$365.256\ 360\ 42+0.000\ 000\ 0011\ (t-1900)$	
Anomalistic	$365.259\ 641\ 34+0.000\ 000\ 0304\ (t-1900)$	
Eclipse	$346.620\ 000\ \ +0.000\ 000\ 36\ \ (t-1900)$	

Length of the month:

	d	d	h	m	s	
Synodical (ordinary)	29.530 588 =	29	12	44	2.8	Hansen.
Tropical	27.321 582 =	27	7	43	4.7	
Sidereal	27 321 661 =	27	7	43	11.5	
Anomalistic	27.554 550 =	27	13	18	33.1	
Nodical	27.212 219 =	27	5	5	35.7	

Length of the day:

	h	m	s	
Sidereal	23	56	4.091	of mean solar time.
Mean Solar	24	3	56.555	of sidereal time.

Dimensions of the Earth (Hayford's Spheroid of 1909):

Equatorial Radius, $a=6378.388$ kilometers or 3963.34 statute miles.

Polar Radius, $b=6356.909$ " or 3949.99 " "

Flattening, $\frac{a-b}{a}=\frac{1}{297.0}$

Logarithm of the eccentricity $\frac{\sqrt{a^2-b^2}}{a}=\log e=8.913\ 804$

Logarithm radius $=\log\rho=9.999\ 2695+0.000\ 7324\cos 2\varphi-0.000\ 0019\cos 4\varphi$.

Reduction from geographic latitude φ to geocentric latitude φ',

$$\varphi'-\varphi=-11'\ 35''.66\sin 2\varphi+1''.17\sin 4\varphi.$$

1 degree of latitude (in statute miles) $=69.0569-0.3494\cos 2\varphi+0.0007\cos 4\varphi$.

1 degree of longitude (in statute miles) $=69.2316\cos\varphi-0.0584\cos 3\varphi+0.0001\cos 5\varphi$.

1 meter = 3.280 8333 feet. 1 foot = 0.304 8006 meters.

1 statute mile = 0.868 362 nautical or geographical miles.

1 nautical mile = 1.151 594 statute miles.

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* Used in the computation of eclipses. The parallax used in the computation of the ephemeris of the Moon contained in this volume is $57'\ 2''.23$ (Hansen).

† k^2 is the acceleration due to the Sun's attraction at the mean distance of the Earth from the Sun, which is also the astronomical unit of distance, the unit of time being one mean solar day.

‡ φ = latitude, h = elevation above sea level in meters, and $\log R=6.80416$.

NOTE.—The above values of $\log\rho$ and $\varphi'-\varphi$ were computed with the eccentricity that results from assuming that the flattening of the earth is exactly $\frac{1}{297}$.

ASTRONOMICAL CONSTANTS.

SEMIDIAMETERS OF THE SUN, MOON, AND PLANETS.

Name.	At Unit Distance.	At Mean Least Distance.	In Kilometers.	In Statute Miles.	Authority.
	′ ″	″			
Sun	15 59.63	. .	695 553.46	432 196.01	Auwers.
Moon	15 32.58*	. .	1 738.02	1 079.96	Newcomb.
Mercury	3.34	5.45	2 420.89	1 504.27	Le Verrier.
Venus	8.55	30.90	6 197.18	3 850.74	Peirce.
Mars	5.05	9.64	3 660.32	2 274.42	Peirce.
Jupiter (Equatorial)	1 40.20	23.84	72 626.64	45 128.01	Am. Eph.
Jupiter (Polar)	1 34.12	22.40	68 219.76	42 389.71	Peirce.
Saturn (Equatorial)	1 24.88	9.94	61 522.45	38 228.20	Barnard.
Saturn (Polar)	1 17.47	9.07	56 151.56	34 890.89	Barnard.
Uranus	33.52	1.84	24 295.86	15 096.72	Am. Eph.
Neptune	38.66	1.33	28 021.42	17 411.67	Am. Eph.

ELEMENTS OF THE PLANETARY ORBITS FOR THE EPOCH 1919—January 0^d G. M. T.

Name.	Mean Distance.	Sidereal Period in Tropical Years.	Sidereal Mean Daily Motion.	Synodic Period in Tropical Years.	Eccentricity.
			″		
☿ Mercury	0.387 099	0.240 85	14 732.420	0.317 26	0.205 6181
♀ Venus	0.723 331	0.615 21	5 767.670	1.598 72	0.006 8116
⊕ Earth	1.000 000	1.000 04	3 548.193	. . .	0.016 7431
♂ Mars	1.523 688	1.880 89	1 886.519	2.135 39	0.093 3262
♃ Jupiter	5.202 803	11.862 23	299.128	1.092 11	0.048 3686
♄ Saturn	9.538 843	29.457 72	120.455	1.035 18	0.055 8241
⛢ Uranus	19.190 978	84.015 29	42.23	1.012 09	0.047 0978
♆ Neptune	30.070 672	164.788 29	21.53	1.006 14	0.008 5454

Name.	Inclination to the Ecliptic.	Mean Longitude of the Node.	Mean Longitude of the Perihelion.	Mean Longitude at the Epoch.	Logarithm of Mass in Unit of Sun's Mass.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	
☿ Mercury	7 0 11.6	47 22 16.0	76 11 42.8	135 10 59.71	3.221 8487−10
♀ Venus	3 23 37.8	75 57 2.2	130 25 52.7	300 12 56.52	4.389 3398−10
⊕ Earth	. . .	. . . .	101 32 50.9	99 6 12.78	4.482 2896−10
♂ Mars	1 51 0.9	48 55 56.9	334 34 5.4	330 16 38.76	3.509 5499−10
♃ Jupiter	1 18 27.7	99 37 47.9	13 1 3.6	94 53 5.72	6.979 9082−10
♄ Saturn	2 29 29.6	112 56 57.3	91 27 39.2	139 0 24.68	6.455 7335−10
⛢ Uranus	0 46 22.0	73 35 8.9	169 21 9.6	325 2 6.33	5.640 7528−10
♆ Neptune	1 46 38.8	130 53 15.8	43 55 18.0	126 47 41.52	5.705 5338−10

The elements of the four inner planets are derived from those given by NEWCOMB in Vol. VI of the *Astronomical Papers of the American Ephemeris*, and are the same as those used in computing the ephemerides of these planets. Those of Jupiter, Saturn, Uranus, and Neptune are taken from Vol. VII of the *Astronomical Papers* for the epoch of the tables. They are reduced to 1919 by applying LE VERRIER's variations, and can not be regarded as being strictly identical with the elements used in computing the ephemerides of those planets in this volume.

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* At mean distance. See *Ast. Papers Am. Eph.*, Vol. IX, p. 39. For the values of the semidiameter used in this volume see page xi.

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.
☾	The Moon.
☿	Mercury.
♀	Venus.
⊕	The Earth.
♂	Mars.
♃	Jupiter.
♄	Saturn.
♅	Uranus.
♆	Neptune.

SIGNS OF THE ZODIAC.

Spring Signs.	1.	♈	Aries.
	2.	♉	Taurus.
	3.	♊	Gemini.
Summer Signs.	4.	♋	Cancer.
	5.	♌	Leo.
	6.	♍	Virgo.
Autumn Signs.	7.	♎	Libra.
	8.	♏	Scorpius.
	9.	♐	Sagittarius.
Winter Signs.	10.	♑	Capricornus.
	11.	♒	Aquarius.
	12.	♓	Pisces.

ASPECTS.

☌	Conjunction, or having the same Longitude or Right Ascension.
□	Quadrature, or differing ±90° in Longitude or Right Ascension.
☍	Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

☊	Ascending Node.
☋	Descending Node.
N.	North.
S.	South.
E.	East.
W.	West.
°	Degrees.
′	Minutes of Arc.
″	Seconds of Arc.
$^{\mathrm{h}}$	Hours.
$^{\mathrm{m}}$	Minutes of Time.
$^{\mathrm{s}}$	Seconds of Time.

PART I.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

SUN, 1919.

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
Jan. 1	We	18 43 40.17	11.052	–23 4 9.2	+11.53	16 17.82	8.95	– 3 19.09	–1.195	18 40 21.08
2	Th	18 48 5.26	11.039	22 59 18.6	12.68	16 17.82	8.95	3 47.62	1.182	18 44 17.63
3	Fr	18 52 30.01	11.024	22 54 0.5	13.83	16 17.83	8.95	4 15.82	1.168	18 48 14.19
4	Sa	18 56 54.40	11.008	22 48 15.0	14.96	16 17.82	8.95	4 43.65	1.152	18 52 10.75
5	Su	19 1 18.39	10.991	22 42 2.4	16.09	16 17.82	8.95	5 11.09	1.134	18 56 7.31
6	Mo	19 5 41.95	10.972	–22 35 22.9	+17.21	16 17.81	8.95	– 5 38.09	–1.115	19 0 3.86
7	Tu	19 10 5.04	10.952	22 28 16.6	18.32	16 17.80	8.95	6 4.62	1.095	19 4 0.42
8	We	19 14 27.64	10.931	22 20 43.7	19.42	16 17.78	8.95	6 30.66	1.074	19 7 56.98
9	Th	19 18 49.71	10.908	22 12 44.6	20.51	16 17.75	8.95	6 56.17	1.052	19 11 53.54
10	Fr	19 23 11.23	10.885	22 4 19.4	21.59	16 17.72	8.95	7 21.13	1.028	19 15 50.09
11	Sa	19 27 32.17	10.860	–21 55 28.3	+22.66	16 17.69	8.95	– 7 45.52	–1.004	19 19 46.65
12	Su	19 31 52.53	10.835	21 46 11.7	23.72	16 17.65	8.95	8 9.32	0.979	19 23 43.21
13	Mo	19 36 12.26	10.809	21 36 29.8	24.77	16 17.60	8.95	8 32.50	0.953	19 27 39.77
14	Tu	19 40 31.36	10.782	21 26 22.9	25.81	16 17.55	8.95	8 55.04	0.926	19 31 36.32
15	We	19 44 49.81	10.755	21 15 51.2	26.83	16 17.49	8.95	9 16.93	0.898	19 35 32.88
16	Th	19 49 7.60	10.727	–21 4 55.0	+27.85	16 17.43	8.95	– 9 38.16	–0.871	19 39 29.44
17	Fr	19 53 24.70	10.698	20 53 34.6	28.85	16 17.36	8.95	9 58.71	0.842	19 43 26.00
18	Sa	19 57 41.12	10.669	20 41 50.4	29.84	16 17.28	8.94	10 18.57	0.813	19 47 22.55
19	Su	20 1 56.83	10.640	20 29 42.5	30.82	16 17.20	8.94	10 37.72	0.783	19 51 19.11
20	Mo	20 6 11.83	10.610	20 17 11.4	31.78	16 17.11	8.94	10 56.16	0.753	19 55 15.67
21	Tu	20 10 26.10	10.579	–20 4 17.3	+32.73	16 17.01	8.94	–11 13.87	–0.723	19 59 12.22
22	We	20 14 39.63	10.548	19 51 0.7	33.66	16 16.91	8.94	11 30.85	0.692	20 3 8.78
23	Th	20 18 52.41	10.517	19 37 21.8	34.58	16 16.81	8.94	11 47.07	0.660	20 7 5.34
24	Fr	20 23 4.43	10.485	19 23 21.0	35.48	16 16.70	8.94	12 2.54	0.629	20 11 1.89
25	Sa	20 27 15.68	10.453	19 8 58.7	36.37	16 16.58	8.94	12 17.24	0.596	20 14 58.45
26	Su	20 31 26.16	10.420	–18 54 15.2	+37.25	16 16.46	8.94	–12 31.16	–0.564	20 18 55.00
27	Mo	20 35 35.85	10.387	18 39 11.0	38.10	16 16.34	8.94	12 44.29	0.531	20 22 51.56
28	Tu	20 39 44.75	10.355	18 23 46.4	38.94	16 16.21	8.93	12 56.64	0.498	20 26 48.12
29	We	20 43 52.85	10.321	18 8 1.8	39.77	16 16.08	8.93	13 8.18	0.464	20 30 44.67
30	Th	20 48 0.15	10.287	17 51 57.7	40.57	16 15.95	8.93	13 18.92	0.431	20 34 41.23
31	Fr	20 52 6.63	10.253	–17 35 34.4	+41.36	16 15.81	8.93	–13 28.85	–0.396	20 38 37.78
Feb. 1	Sa	20 56 12.29	10.219	17 18 52.4	42.14	16 15.67	8.93	13 37.95	0.362	20 42 34.34
2	Su	21 0 17.13	10.185	17 1 52.0	42.89	16 15.53	8.93	13 46.24	0.328	20 46 30.90
3	Mo	21 4 21.15	10.150	16 44 33.8	43.62	16 15.38	8.93	13 53.70	0.293	20 50 27.45
4	Tu	21 8 24.33	10.115	16 26 58.2	44.34	16 15.22	8.93	14 0.32	0.259	20 54 24.01
5	We	21 12 26.68	10.081	–16 9 5.5	+45.04	16 15.07	8.92	–14 6.12	–0.224	20 58 20.56
6	Th	21 16 28.20	10.046	15 50 56.2	45.73	16 14.92	8.92	14 11.08	0.189	21 2 17.12
7	Fr	21 20 28.89	10.011	15 32 30.7	46.39	16 14.76	8.92	14 15.21	0.155	21 6 13.67
8	Sa	21 24 28.75	9.977	15 13 49.5	47.04	16 14.60	8.92	14 18.52	0.121	21 10 10.23
9	Su	21 28 27.80	9.943	14 54 52.9	47.67	16 14.43	8.92	14 21.02	0.087	21 14 6.78
10	Mo	21 32 26.03	9.910	–14 35 41.4	+48.29	16 14.25	8.92	–14 22.70	–0.053	21 18 3.34
11	Tu	21 36 23.47	9.877	14 16 15.3	48.88	16 14.08	8.92	14 23.58	–0.020	21 21 59.89
12	We	21 40 20.12	9.844	13 56 35.1	49.47	16 13.90	8.91	14 23.67	+0.012	21 25 56.44
13	Th	21 44 15.99	9.812	13 36 41.1	50.03	16 13.71	8.91	14 22.99	0.044	21 29 53.00
14	Fr	21 48 11.10	9.781	13 16 33.8	50.58	16 13.52	8.91	14 21.54	0.076	21 33 49.55
15	Sa	21 52 5.46	9.749	–12 56 13.5	+51.11	16 13.33	8.91	–14 19.35	+0.107	21 37 46.11
16	Su	21 55 59.08	9.719	–12 35 40.6	+51.63	16 13.12	8.91	–14 16.42	+0.137	21 41 42.66

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 26′ ″	h m s
Jan. 1	1	280 2 26.4	152.95	+0.09	9.992 6918	− 1.3	0.01	+16.92	20.81	56.00	5 18 46.56
2	2	281 3 37.3	152.95	0.22	9.992 6895	− 0.6	0.15	16.96	20.81	56.00	5 14 50.65
3	3	282 4 48.3	152.95	0.33	9.992 6889	+ 0.1	0.29	17.00	20.81	56.00	5 10 54.73
4	4	283 5 59.2	152.95	0.41	9.992 6900	0.8	0.42	17.04	20.81	56.00	5 6 58.82
5	5	284 7 9.8	152.94	0.47	9.992 6928	1.5	0.56	17.08	20.81	56.00	5 3 2.91
6	6	285 8 20.2	152.93	+0.49	9.992 6973	+ 2.3	0.70	+17.12	20.81	56.00	4 59 7.00
7	7	286 9 30.2	152.91	0.48	9.992 7037	3.0	0.84	17.16	20.81	56.00	4 55 11.09
8	8	287 10 39.7	152.89	0.44	9.992 7121	4.0	0.97	17.19	20.81	56.00	4 51 15.18
9	9	288 11 48.8	152.86	0.38	9.992 7227	4.9	1.11	17.22	20.81	56.00	4 47 19.26
10	10	289 12 57.2	152.84	0.29	9.992 7354	5.8	1.25	17.26	20.81	56.00	4 43 23.35
11	11	290 14 5.1	152.81	+0.17	9.992 7506	+ 6.9	1.39	+17.29	20.81	56.00	4 39 27.44
12	12	291 15 12.4	152.79	+0.03	9.992 7683	8.0	1.53	17.33	20.81	56.01	4 35 31.53
13	13	292 16 19.0	152.76	−0.11	9.992 7887	9.1	1.66	17.36	20.81	56.01	4 31 35.62
14	14	293 17 25.1	152.74	0.25	9.992 8118	10.2	1.80	17.39	20.81	56.02	4 27 39.71
15	15	294 18 30.6	152.72	0.37	9.992 8377	11.4	1.94	17.42	20.80	56.02	4 23 43.80
16	16	295 19 35.5	152.70	−0.48	9.992 8664	+12.6	2.08	+17.44	20.80	56.03	4 19 47.88
17	17	296 20 40.0	152.68	0.56	9.992 8980	13.7	2.21	17.47	20.80	56.03	4 15 51.97
18	18	297 21 44.0	152.66	0.62	9.992 9323	14.9	2.35	17.49	20.80	56.04	4 11 56.06
19	19	298 22 47.5	152.64	0.65	9.992 9694	16.0	2.49	17.52	20.80	56.05	4 8 0.15
20	20	299 23 50.6	152.62	0.65	9.993 0091	17.1	2.63	17.54	20.80	56.06	4 4 4.24
21	21	300 24 53.2	152.60	−0.63	9.993 0513	+18.1	2.76	+17.56	20.79	56.06	4 0 8.33
22	22	301 25 55.4	152.58	0.58	9.993 0958	19.0	2.90	17.58	20.79	56.07	3 56 12.42
23	23	302 26 57.1	152.56	0.51	9.993 1427	20.0	3.04	17.60	20.79	56.08	3 52 16.51
24	24	303 27 58.3	152.54	0.41	9.993 1917	20.9	3.18	17.61	20.79	56.09	3 48 20.60
25	25	304 28 59.0	152.52	0.30	9.993 2428	21.7	3.31	17.63	20.79	56.10	3 44 24.69
26	26	305 29 59.1	152.49	−0.18	9.993 2958	+22.5	3.45	+17.64	20.78	56.11	3 40 28.78
27	27	306 30 58.6	152.46	−0.05	9.993 3506	23.2	3.59	17.65	20.78	56.11	3 36 32.87
28	28	307 31 57.4	152.43	+0.07	9.993 4072	23.9	3.73	17.66	20.78	56.12	3 32 36.96
29	29	308 32 55.4	152.40	0.19	9.993 4654	24.5	3.86	17.67	20.77	56.13	3 28 41.05
30	30	309 33 52.7	152.37	0.30	9.993 5250	25.1	4.00	17.68	20.77	56.14	3 24 45.14
31	31	310 34 49.0	152.33	+0.39	9.993 5860	+25.7	4.14	+17.68	20.77	56.15	3 20 49.23
Feb. 1	32	311 35 44.3	152.28	0.45	9.993 6483	26.2	4.28	17.69	20.77	56.17	3 16 53.32
2	33	312 36 38.5	152.23	0.49	9.993 7120	26.8	4.42	17.69	20.76	56.18	3 12 57.41
3	34	313 37 31.5	152.18	0.49	9.993 7769	27.3	4.55	17.69	20.76	56.19	3 9 1.50
4	35	314 38 23.2	152.12	0.46	9.993 8432	27.9	4.69	17.69	20.76	56.20	3 5 5.59
5	36	315 39 13.4	152.06	+0.40	9.993 9109	+28.5	4.83	+17.68	20.75	56.21	3 1 9.68
6	37	316 40 2.2	152.00	0.32	9.993 9801	29.2	4.97	17.68	20.75	56.22	2 57 13.77
7	38	317 40 49.5	151.94	0.21	9.994 0509	29.9	5.10	17.67	20.75	56.23	2 53 17.86
8	39	318 41 35.2	151.87	+0.08	9.994 1235	30.7	5.24	17.66	20.74	56.24	2 49 21.95
9	40	319 42 19.3	151.81	−0.05	9.994 1980	31.5	5.38	17.65	20.74	56.25	2 45 26.04
10	41	320 43 1.8	151.74	−0.18	9.994 2745	+32.3	5.52	+17.64	20.74	56.26	2 41 30.13
11	42	321 43 42.8	151.67	0.30	9.994 3530	33.2	5.65	17.63	20.73	56.27	2 37 34.23
12	43	322 44 22.1	151.61	0.41	9.994 4338	34.1	5.79	17.62	20.73	56.28	2 33 38.32
13	44	323 44 59.9	151.54	0.49	9.994 5167	35.0	5.93	17.60	20.72	56.29	2 29 42.41
14	45	324 45 36.1	151.48	0.55	9.994 6018	35.9	6.07	17.58	20.72	56.30	2 25 46.50
15	46	325 46 10.9	151.42	−0.59	9.994 6891	+36.8	6.20	+17.56	20.72	56.31	2 21 50.59
16	47	326 46 44.2	151.36	−0.60	9.994 7786	+37.7	6.34	+17.54	20.71	56.32	2 17 54.68

SUN, 1919.

FOR GREENWICH MEAN NOON.

ate.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
b. 16	Su	21 55 59.08	9.719	−12 35 40.6	+51.63	16 13.12	8.91	−14 16.42	+0.137	21 41 42.66
17	Mo	21 59 51.99	9.690	12 14 55.6	52.13	16 12.92	8.90	14 12.78	0.167	21 45 39.21
18	Tu	22 3 44.20	9.661	11 53 58.7	52.61	16 12.71	8.90	14 8.43	0.196	21 49 35.77
19	We	22 7 35.72	9.633	11 32 50.5	53.07	16 12.50	8.90	14 3.40	0.224	21 53 32.32
20	Th	22 11 26.57	9.605	11 11 31.4	53.52	16 12.28	8.90	13 57.70	0.251	21 57 28.88
21	Fr	22 15 16.77	9.578	−10 50 1.6	+53.96	16 12.06	8.90	−13 51.34	+0.278	22 1 25.43
22	Sa	22 19 6.32	9.552	10 28 21.7	54.37	16 11.83	8.89	13 44.34	0.305	22 5 21.98
23	Su	22 22 55.25	9.526	10 6 32.1	54.76	16 11.61	8.89	13 36.71	0.331	22 9 18.54
24	Mo	22 26 43.57	9.501	9 44 33.1	55.15	16 11.37	8.89	13 28.48	0.355	22 13 15.09
25	Tu	22 30 31.30	9.477	9 22 25.1	55.51	16 11.14	8.89	13 19.66	0.380	22 17 11.64
26	We	22 34 18.46	9.453	− 9 0 8.7	+55.85	16 10.91	8.89	−13 10.26	+0.403	22 21 8.20
27	Th	22 38 5.05	9.430	8 37 44.2	56.19	16 10.67	8.88	13 0.30	0.426	22 25 4.75
28	Fr	22 41 51.10	9.408	8 15 11.9	56.50	16 10.43	8.88	12 49.80	0.449	22 29 1.30
r. 1	Sa	22 45 36.62	9.386	7 52 32.4	56.79	16 10.19	8.88	12 38.76	0.471	22 32 57.86
2	Su	22 49 21.62	9.364	7 29 46.0	57.07	16 9.95	8.88	12 27.21	0.492	22 36 54.41
3	Mo	22 53 6.11	9.343	− 7 6 53.3	+57.32	16 9.70	8.88	−12 15.15	+0.513	22 40 50.96
4	Tu	22 56 50.11	9.323	6 43 54.6	57.57	16 9.46	8.87	12 2.60	0.533	22 44 47.52
5	We	23 0 33.64	9.304	6 20 50.3	57.79	16 9.22	8.87	11 49.57	0.553	22 48 44.07
6	Th	23 4 16.70	9.285	5 57 40.8	58.00	16 8.97	8.87	11 36.08	0.571	22 52 40.62
7	Fr	23 7 59.32	9.267	5 34 26.6	58.19	16 8.73	8.87	11 22.15	0.589	22 56 37.17
8	Sa	23 11 41.51	9.249	− 5 11 8.0	+58.36	16 8.48	8.86	−11 7.79	+0.607	23 0 33.73
9	Su	23 15 23.30	9.233	4 47 45.4	58.52	16 8.23	8.86	10 53.02	0.624	23 4 30.28
10	Mo	23 19 4.69	9.217	4 24 19.2	58.66	16 7.98	8.86	10 37.85	0.640	23 8 26.83
11	Tu	23 22 45.71	9.202	4 0 49.8	58.79	16 7.72	8.86	10 22.32	0.654	23 12 23.38
12	We	23 26 26.38	9.188	3 37 17.5	58.90	16 7.47	8.85	10 6.45	0.668	23 16 19.94
13	Th	23 30 6.73	9.175	− 3 13 42.7	+59.00	16 7.21	8.85	− 9 50.25	+0.682	23 20 16.49
14	Fr	23 33 46.78	9.163	2 50 5.8	59.08	16 6.95	8.85	9 33.74	0.694	23 24 13.04
15	Sa	23 37 26.55	9.152	2 26 27.0	59.15	16 6.69	8.85	9 16.96	0.705	23 28 9.59
16	Su	23 41 6.07	9.142	2 2 46.8	59.20	16 6.42	8.85	8 59.92	0.715	23 32 6.15
17	Mo	23 44 45.35	9.132	1 39 5.5	59.24	16 6.15	8.84	8 42.65	0.724	23 36 2.70
18	Tu	23 48 24.43	9.124	− 1 15 23.4	+59.27	16 5.88	8.84	− 8 25.18	+0.732	23 39 59.25
19	We	23 52 3.33	9.117	0 51 40.9	59.28	16 5.61	8.84	8 7.52	0.739	23 43 55.80
20	Th	23 55 42.06	9.111	0 27 58.3	59.27	16 5.33	8.84	7 49.70	0.745	23 47 52.36
21	Fr	23 59 20.66	9.106	− 0 4 16.0	59.25	16 5.06	8.83	7 31.75	0.751	23 51 48.91
22	Sa	0 2 59.14	9.101	+ 0 19 25.6	59.21	16 4.78	8.83	7 13.68	0.755	23 55 45.46
23	Su	0 6 37.53	9.098	+ 0 43 6.2	+59.16	16 4.50	8.83	− 6 55.52	+0.758	23 59 42.01
24	Mo	0 10 15.85	9.095	1 6 45.4	59.10	16 4.22	8.82	6 37.28	0.761	0 3 38.56
25	Tu	0 13 54.12	9.094	1 30 22.9	59.02	16 3.94	8.82	6 19.00	0.762	0 7 35.12
26	We	0 17 32.36	9.093	1 53 58.3	58.93	16 3.66	8.82	6 0.69	0.763	0 11 31.67
27	Th	0 21 10.59	9.093	2 17 31.3	58.82	16 3.37	8.82	5 42.37	0.763	0 15 28.22
28	Fr	0 24 48.84	9.094	+ 2 41 1.5	+58.69	16 3.09	8.81	− 5 24.06	+0.762	0 19 24.77
29	Sa	0 28 27.11	9.095	3 4 28.5	58.55	16 2.81	8.81	5 5.78	0.761	0 23 21.33
30	Su	0 32 5.43	9.098	3 27 52.0	58.40	16 2.53	8.81	4 47.55	0.758	0 27 17.88
31	Mo	0 35 43.81	9.101	3 51 11.5	58.23	16 2.25	8.81	4 29.38	0.755	0 31 14.43
r. 1	Tu	0 39 22.27	9.104	4 14 26.7	58.04	16 1.98	8.80	4 11.29	0.752	0 35 10.98
2	We	0 43 0.82	9.108	+ 4 37 37.3	+57.84	16 1.70	8.80	− 3 53.28	+0.748	0 39 7.54
3	Th	0 46 39.47	9.113	+ 5 0 42.7	+57.62	16 1.43	8.80	− 3 35.38	+0.743	0 43 4.09

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 26′ ″	h m s
Feb. 16	47	326 46 44.2	151.36	−0.60	9.994 7786	+37.7	6.34	+17.54	20.71	56.32	2 17 54.68
17	48	327 47 16.2	151.30	0.58	9.994 8702	38.6	6.48	17.52	20.71	56.33	2 13 58.78
18	49	328 47 46.7	151.24	0.52	9.994 9638	39.4	6.62	17.50	20.70	56.33	2 10 2.87
19	50	329 48 15.8	151.19	0.45	9.995 0593	40.2	6.75	17.47	20.70	56.34	2 6 6.96
20	51	330 48 43.6	151.13	0.36	9.995 1566	40.9	6.89	17.44	20.69	56.35	2 2 11.05
21	52	331 49 10.0	151.07	−0.25	9.995 2556	+41.6	7.03	+17.42	20.69	56.36	1 58 15.14
22	53	332 49 35.0	151.01	0.13	9.995 3561	42.2	7.17	17.39	20.68	56.36	1 54 19.24
23	54	333 49 58.7	150.96	−0.01	9.995 4580	42.7	7.31	17.36	20.68	56.37	1 50 23.33
24	55	334 50 21.0	150.90	+0.12	9.995 5613	43.3	7.44	17.32	20.67	56.38	1 46 27.42
25	56	335 50 41.8	150.84	0.24	9.995 6657	43.7	7.58	17.29	20.67	56.38	1 42 31.51
26	57	336 51 1.2	150.78	+0.34	9.995 7712	+44.1	7.72	+17.26	20.66	56.39	1 38 35.61
27	58	337 51 19.0	150.71	0.43	9.995 8775	44.4	7.86	17.22	20.66	56.39	1 34 39.70
28	59	338 51 35.4	150.65	0.50	9.995 9845	44.7	7.99	17.18	20.65	56.40	1 30 43.79
Mar. 1	60	339 51 50.0	150.58	0.55	9.996 0921	44.9	8.13	17.15	20.65	56.40	1 26 47.88
2	61	340 52 3.0	150.50	0.56	9.996 2001	45.1	8.27	17.11	20.64	56.40	1 22 51.98
3	62	341 52 14.2	150.43	+0.53	9.996 3086	+45.3	8.41	+17.07	20.64	56.41	1 18 56.07
4	63	342 52 23.4	150.34	0.47	9.996 4175	45.5	8.54	17.03	20.63	56.41	1 15 0.16
5	64	343 52 30.7	150.26	0.38	9.996 5268	45.7	8.68	16.98	20.63	56.41	1 11 4.26
6	65	344 52 35.9	150.17	0.28	9.996 6366	45.9	8.82	16.94	20.62	56.41	1 7 8.35
7	66	345 52 38.9	150.08	0.16	9.996 7470	46.2	8.96	16.90	20.62	56.41	1 3 12.44
8	67	346 52 39.8	149.99	+0.03	9.996 8581	+46.5	9.09	+16.85	20.61	56.41	0 59 16.54
9	68	347 52 38.5	149.90	−0.10	9.996 9700	46.8	9.23	16.81	20.61	56.41	0 55 20.63
10	69	348 52 34.9	149.81	0.22	9.997 0827	47.2	9.37	16.76	20.60	56.41	0 51 24.72
11	70	349 52 29.1	149.71	0.33	9.997 1965	47.6	9.51	16.71	20.60	56.41	0 47 28.82
12	71	350 52 21.2	149.62	0.42	9.997 3113	48.1	9.64	16.67	20.59	56.41	0 43 32.91
13	72	351 52 11.1	149.53	−0.49	9.997 4273	+48.6	9.78	+16.62	20.59	56.40	0 39 37.00
14	73	352 51 58.8	149.45	0.53	9.997 5445	49.1	9.92	16.57	20.58	56.40	0 35 41.10
15	74	353 51 44.5	149.36	0.53	9.997 6628	49.6	10.06	16.53	20.57	56.40	0 31 45.19
16	75	354 51 28.1	149.28	0.51	9.997 7824	50.1	10.19	16.48	20.57	56.39	0 27 49.28
17	76	355 51 9.8	149.20	0.46	9.997 9031	50.5	10.33	16.43	20.56	56.38	0 23 53.38
18	77	356 50 49.5	149.11	−0.39	9.998 0249	+51.0	10.47	+16.38	20.56	56.38	0 19 57.47
19	78	357 50 27.3	149.04	0.29	9.998 1477	51.4	10.61	16.33	20.55	56.37	0 16 1.56
20	79	358 50 3.2	148.96	0.18	9.998 2714	51.7	10.75	16.28	20.55	56.36	0 12 5.66
21	80	359 49 37.3	148.88	−0.06	9.998 3960	52.1	10.88	16.23	20.54	56.35	0 8 9.75
22	81	0 49 9.5	148.81	+0.06	9.998 5213	52.4	11.02	16.18	20.53	56.34	0 4 13.85
23	82	1 48 40.0	148.73	+0.18	9.998 6473	+52.6	11.16	+16.13	20.53	56.33	0 0 17.94 23 56 22.03
24	83	2 48 8.7	148.66	0.30	9.998 7737	52.7	11.30	16.08	20.52	56.32	23 52 26.13
25	84	3 47 35.6	148.59	0.41	9.998 9004	52.9	11.43	16.03	20.52	56.31	23 48 30.22
26	85	4 47 0.8	148.51	0.51	9.999 0274	52.9	11.57	15.98	20.51	56.30	23 44 34.31
27	86	5 46 24.2	148.44	0.58	9.999 1543	52.9	11.71	15.93	20.50	56.29	23 40 38.41
28	87	6 45 45.9	148.36	+0.62	9.999 2812	+52.8	11.85	+15.88	20.50	56.27	23 36 42.50
29	88	7 45 5.7	148.29	0.63	9.999 4077	52.6	11.98	15.84	20.49	56.26	23 32 46.59
30	89	8 44 23.7	148.21	0.60	9.999 5337	52.4	12.12	15.79	20.49	56.25	23 28 50.69
31	90	9 43 39.7	148.12	0.55	9.999 6592	52.1	12.26	15.74	20.48	56.23	23 24 54.78
Apr. 1	91	10 42 53.7	148.04	0.47	9.999 7840	51.9	12.40	15.69	20.47	56.21	23 20 58.87
2	92	11 42 5.6	147.95	+0.37	9.999 9081	+51.6	12.53	+15.65	20.47	56.20	23 17 2.96
3	93	12 41 15.3	147.86	+0.25	0.000 0316	+51.3	12.67	+15.60	20.46	56.18	23 13 7.06

SUN, 1919.

FOR GREENWICH MEAN NOON.

ate.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
r. 1	Tu	0 39 22.27	9.104	+ 4 14 26.7	+58.04	16 1.98	8.80	−4 11.29	+0.752	0 35 10.98
2	We	0 43 0.82	9.108	4 37 37.3	57.84	16 1.70	8.80	3 53.28	0.748	0 39 7.54
3	Th	0 46 39.47	9.113	5 0 42.7	57.62	16 1.43	8.80	3 35.38	0.743	0 43 4.09
4	Fr	0 50 18.24	9.118	5 23 42.8	57.39	16 1.16	8.80	3 17.60	0.738	0 47 0.64
5	Sa	0 53 57.15	9.124	5 46 37.1	57.14	16 0.89	8.79	2 59.96	0.732	0 50 57.19
6	Su	0 57 36.21	9.131	+ 6 9 25.2	+56.87	16 0.62	8.79	−2 42.46	+0.726	0 54 53.75
7	Mo	1 1 15.43	9.138	6 32 6.9	56.60	16 0.35	8.79	2 25.14	0.718	0 58 50.30
8	Tu	1 4 54.85	9.147	6 54 41.7	56.31	16 0.08	8.79	2 8.00	0.710	1 2 46.85
9	We	1 8 34.47	9.155	7 17 9.5	56.00	15 59.81	8.78	1 51.06	0.701	1 6 43.40
10	Th	1 12 14.31	9.165	7 39 29.7	55.68	15 59.55	8.78	1 34.35	0.691	1 10 39.96
11	Fr	1 15 54.39	9.175	+ 8 1 42.2	+55.35	15 59.28	8.78	−1 17.88	+0.681	1 14 36.51
12	Sa	1 19 34.74	9.187	8 23 46.5	55.01	15 59.01	8.78	1 1.68	0.669	1 18 33.06
13	Su	1 23 15.37	9.199	8 45 42.5	54.65	15 58.74	8.78	0 45.76	0.657	1 22 29.62
14	Mo	1 26 56.30	9.212	9 7 29.6	54.28	15 58.48	8.77	0 30.14	0.644	1 26 26.17
15	Tu	1 30 37.56	9.226	9 29 7.7	53.89	15 58.21	8.77	−0 14.84	0.631	1 30 22.72
16	We	1 34 19.15	9.240	+ 9 50 36.4	+53.50	15 57.94	8.77	+0 0.12	+0.616	1 34 19.28
17	Th	1 38 1.11	9.256	10 11 55.4	53.08	15 57.67	8.77	0 14.72	0.601	1 38 15.83
18	Fr	1 41 43.44	9.272	10 33 4.3	52.66	15 57.41	8.76	0 28.94	0.584	1 42 12.38
19	Sa	1 45 26.16	9.289	10 54 2.9	52.22	15 57.14	8.76	0 42.77	0.568	1 46 8.94
20	Su	1 49 9.30	9.306	11 14 50.8	51.77	15 56.87	8.76	0 56.19	0.550	1 50 5.49
21	Mo	1 52 52.87	9.324	+11 35 27.7	+51.30	15 56.61	8.76	+1 9.18	+0.532	1 54 2.04
22	Tu	1 56 36.87	9.343	11 55 53.2	50.82	15 56.34	8.75	1 21.72	0.513	1 57 58.60
23	We	2 0 21.34	9.363	12 16 7.0	50.33	15 56.08	8.75	1 33.81	0.494	2 1 55.15
24	Th	2 4 6.28	9.382	12 36 8.8	49.82	15 55.82	8.75	1 45.43	0.474	2 5 51.70
25	Fr	2 7 51.70	9.403	12 55 58.3	49.30	15 55.56	8.75	1 56.56	0.454	2 9 48.26
26	Sa	2 11 37.61	9.423	+13 15 35.1	+48.76	15 55.31	8.74	+2 7.20	+0.433	2 13 44.81
27	Su	2 15 24.03	9.445	13 34 58.9	48.22	15 55.05	8.74	2 17.33	0.412	2 17 41.37
28	Mo	2 19 10.96	9.466	13 54 9.4	47.65	15 54.80	8.74	2 26.96	0.390	2 21 37.92
29	Tu	2 22 58.41	9.488	14 13 6.1	47.07	15 54.56	8.74	2 36.07	0.369	2 25 34.47
30	We	2 26 46.37	9.509	14 31 48.8	46.48	15 54.31	8.73	2 44.66	0.347	2 29 31.03
y 1	Th	2 30 34.86	9.531	+14 50 17.1	+45.88	15 54.07	8.73	+2 52.72	+0.325	2 33 27.58
2	Fr	2 34 23.88	9.553	15 8 30.7	45.25	15 53.84	8.73	3 0.26	0.303	2 37 24.14
3	Sa	2 38 13.42	9.575	15 26 29.2	44.62	15 53.61	8.73	3 7.28	0.281	2 41 20.69
4	Su	2 42 3.49	9.597	15 44 12.4	43.98	15 53.38	8.73	3 13.76	0.259	2 45 17.25
5	Mo	2 45 54.10	9.620	16 1 39.9	43.31	15 53.15	8.72	3 19.70	0.236	2 49 13.80
6	Tu	2 49 45.24	9.642	+16 18 51.4	+42.64	15 52.93	8.72	+3 25.11	+0.214	2 53 10.36
7	We	2 53 36.93	9.665	16 35 46.6	41.96	15 52.71	8.72	3 29.98	0.192	2 57 6.91
8	Th	2 57 29.16	9.688	16 52 25.2	41.26	15 52.49	8.72	3 34.30	0.169	3 1 3.47
9	Fr	3 1 21.95	9.711	17 8 46.9	40.55	15 52.28	8.72	3 38.07	0.146	3 5 0.02
10	Sa	3 5 15.29	9.734	17 24 51.5	39.83	15 52.07	8.71	3 41.29	0.123	3 8 56.58
11	Su	3 9 9.19	9.757	+17 40 38.6	+39.09	15 51.86	8.71	+3 43.95	+0.099	3 12 53.13
12	Mo	3 13 3.65	9.781	17 56 7.9	38.35	15 51.65	8.71	3 46.04	0.075	3 16 49.69
13	Tu	3 16 58.68	9.805	18 11 19.2	37.59	15 51.45	8.71	3 47.56	0.052	3 20 46.24
14	We	3 20 54.28	9.829	18 26 12.2	36.82	15 51.24	8.71	3 48.52	0.028	3 24 42.80
15	Th	3 24 50.45	9.852	18 40 46.6	36.04	15 51.04	8.70	3 48.91	+0.004	3 28 39.35
16	Fr	3 28 47.19	9.876	+18 55 2.1	+35.25	15 50.84	8.70	+3 48.73	−0.020	3 32 35.91
17	Sa	3 32 44.50	9.900	+19 8 58.5	+34.45	15 50.64	8.70	+3 47.97	−0.044	3 36 32.47

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 26′ ″	h m s
Apr. 1	91	10 42 53.7	148.04	+0.47	9.999 7840	+51.9	12.40	+15.69	20.47	56.21	23 20 58.87
2	92	11 42 5.6	147.95	0.37	9.999 9081	51.6	12.53	15.65	20.47	56.20	23 17 2.96
3	93	12 41 15.3	147.86	0.25	0.000 0316	51.3	12.67	15.60	20.46	56.18	23 13 7.06
4	94	13 40 22.8	147.76	+0.12	0.000 1544	51.1	12.81	15.55	20.46	56.16	23 9 11.15
5	95	14 39 28.0	147.67	–0.01	0.000 2767	50.9	12.95	15.51	20.45	56.15	23 5 15.24
6	96	15 38 30.8	147.57	–0.14	0.000 3985	+50.7	13.08	+15.46	20.45	56.13	23 1 19.34
7	97	16 37 31.4	147.48	0.26	0.000 5200	50.6	13.22	15.42	20.44	56.11	22 57 23.43
8	98	17 36 29.6	147.38	0.36	0.000 6413	50.5	13.36	15.38	20.43	56.09	22 53 27.52
9	99	18 35 25.5	147.28	0.43	0.000 7625	50.5	13.50	15.34	20.43	56.07	22 49 31.62
10	100	19 34 19.2	147.19	0.47	0.000 8836	50.5	13.64	15.30	20.42	56.05	22 45 35.71
11	101	20 33 10.6	147.10	–0.48	0.001 0047	+50.5	13.77	+15.26	20.42	56.03	22 41 39.80
12	102	21 31 59.8	147.01	0.47	0.001 1258	50.5	13.91	15.22	20.41	56.01	22 37 43.90
13	103	22 30 46.9	146.92	0.42	0.001 2470	50.5	14.05	15.18	20.41	55.98	22 33 47.99
14	104	23 29 32.0	146.83	0.34	0.001 3683	50.6	14.19	15.14	20.40	55.96	22 29 52.08
15	105	24 28 15.0	146.75	0.25	0.001 4897	50.6	14.32	15.10	20.39	55.94	22 25 56.17
16	106	25 26 56.0	146.67	–0.15	0.001 6110	+50.5	14.46	+15.07	20.39	55.91	22 22 0.27
17	107	26 25 35.2	146.59	–0.03	0.001 7323	50.5	14.60	15.04	20.38	55.89	22 18 4.36
18	108	27 24 12.4	146.52	+0.10	0.001 8536	50.5	14.74	15.00	20.38	55.87	22 14 8.45
19	109	28 22 48.0	146.44	0.23	0.001 9747	50.4	14.87	14.97	20.37	55.84	22 10 12.54
20	110	29 21 21.7	146.37	0.36	0.002 0955	50.3	15.01	14.94	20.37	55.82	22 6 16.64
21	111	30 19 53.8	146.30	+0.48	0.002 2159	+50.1	15.15	+14.91	20.36	55.79	22 2 20.73
22	112	31 18 24.2	146.24	0.58	0.002 3359	49.9	15.29	14.88	20.35	55.77	21 58 24.82
23	113	32 16 53.0	146.17	0.65	0.002 4552	49.6	15.42	14.86	20.35	55.74	21 54 28.91
24	114	33 15 20.3	146.10	0.69	0.002 5738	49.2	15.56	14.83	20.34	55.71	21 50 33.01
25	115	34 13 45.9	146.04	0.70	0.002 6914	48.8	15.70	14.81	20.34	55.69	21 46 37.10
26	116	35 12 10.0	145.97	+0.69	0.002 8079	+48.3	15.84	+14.79	20.33	55.66	21 42 41.19
27	117	36 10 32.5	145.90	0.65	0.002 9231	47.7	15.97	14.77	20.33	55.63	21 38 45.28
28	118	37 8 53.4	145.84	0.58	0.003 0369	47.1	16.11	14.75	20.32	55.61	21 34 49.37
29	119	38 7 12.7	145.77	0.48	0.003 1491	46.4	16.25	14.73	20.32	55.58	21 30 53.47
30	120	39 5 30.2	145.69	0.36	0.003 2596	45.7	16.39	14.71	20.31	55.55	21 26 57.56
May 1	121	40 3 45.9	145.62	+0.23	0.003 3685	+45.0	16.52	+14.69	20.31	55.52	21 23 1.65
2	122	41 1 59.8	145.54	+0.09	0.003 4756	44.3	16.66	14.68	20.30	55.50	21 19 5.74
3	123	42 0 11.7	145.46	–0.05	0.003 5812	43.7	16.80	14.67	20.30	55.47	21 15 9.83
4	124	42 58 21.7	145.38	0.17	0.003 6852	43.0	16.94	14.65	20.29	55.44	21 11 13.92
5	125	43 56 29.8	145.30	0.27	0.003 7877	42.4	17.08	14.64	20.29	55.41	21 7 18.01
6	126	44 54 35.9	145.21	–0.35	0.003 8889	+41.9	17.21	+14.64	20.28	55.38	21 3 22.10
7	127	45 52 40.0	145.13	0.40	0.003 9889	41.4	17.35	14.63	20.28	55.36	20 59 26.20
8	128	46 50 42.2	145.05	0.42	0.004 0877	41.0	17.49	14.62	20.27	55.33	20 55 30.29
9	129	47 48 42.6	144.98	0.41	0.004 1855	40.5	17.63	14.62	20.27	55.30	20 51 34.38
10	130	48 46 41.1	144.90	0.37	0.004 2823	40.1	17.76	14.62	20.26	55.27	20 47 38.47
11	131	49 44 37.8	144.83	–0.30	0.004 3782	+39.8	17.90	+14.61	20.26	55.25	20 43 42.56
12	132	50 42 32.8	144.76	0.21	0.004 4732	39.4	18.04	14.61	20.25	55.22	20 39 46.65
13	133	51 40 26.2	144.69	–0.10	0.004 5674	39.0	18.18	14.61	20.25	55.19	20 35 50.74
14	134	52 38 18.0	144.63	+0.02	0.004 6606	38.7	18.31	14.62	20.25	55.17	20 31 54.83
15	135	53 36 8.3	144.56	0.15	0.004 7530	38.3	18.45	14.62	20.24	55.14	20 27 58.92
16	136	54 33 57.1	144.51	+0.28	0.004 8445	+37.9	18.59	+14.62	20.24	55.11	20 24 3.01
17	137	55 31 44.5	144.45	+0.40	0.004 9351	+37.5	18.73	+14.63	20.23	55.09	20 20 7.10

SUN, 1919.

FOR GREENWICH MEAN NOON.

ate.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
y 17	Sa	3 32 44.50	9.900	+19 8 58.5	+34.45	15 50.64	8.70	+3 47.97	−0.044	3 36 32.47
18	Su	3 36 42.38	9.924	19 22 35.5	33.64	15 50.44	8.70	3 46.64	0.067	3 40 29.02
19	Mo	3 40 40.84	9.948	19 35 52.9	32.81	15 50.25	8.70	3 44.74	0.091	3 44 25.58
20	Tu	3 44 39.87	9.971	19 48 50.3	31.97	15 50.06	8.70	3 42.27	0.115	3 48 22.13
21	We	3 48 39.46	9.995	20 1 27.5	31.13	15 49.87	8.69	3 39.23	0.138	3 52 18.69
22	Th	3 52 39.61	10.018	+20 13 44.3	+30.27	15 49.68	8.69	+3 35.63	−0.161	3 56 15.24
23	Fr	3 56 40.32	10.041	20 25 40.4	29.40	15 49.50	8.69	3 31.48	0.184	4 0 11.80
24	Sa	4 0 41.57	10.064	20 37 15.5	28.52	15 49.32	8.69	3 26.78	0.207	4 4 8.36
25	Su	4 4 43.37	10.086	20 48 29.4	27.63	15 49.15	8.69	3 21.54	0.229	4 8 4.91
26	Mo	4 8 45.69	10.107	20 59 21.9	26.74	15 48.98	8.69	3 15.78	0.251	4 12 1.47
27	Tu	4 12 48.52	10.128	+21 9 52.8	+25.83	15 48.81	8.68	+3 9.51	−0.272	4 15 58.03
28	We	4 16 51.84	10.148	21 20 1.7	24.91	15 48.65	8.68	3 2.74	0.292	4 19 54.58
29	Th	4 20 55.64	10.168	21 29 48.5	23.99	15 48.50	8.68	2 55.50	0.312	4 23 51.14
30	Fr	4 24 59.90	10.187	21 39 13.0	23.05	15 48.35	8.68	2 47.79	0.330	4 27 47.70
31	Sa	4 29 4.60	10.205	21 48 15.0	22.11	15 48.21	8.68	2 39.65	0.348	4 31 44.25
ne 1	Su	4 33 9.72	10.222	+21 56 54.2	+21.16	15 48.07	8.68	+2 31.09	−0.365	4 35 40.81
2	Mo	4 37 15.24	10.238	22 5 10.5	20.20	15 47.93	8.68	2 22.13	0.381	4 39 37.37
3	Tu	4 41 21.13	10.253	22 13 3.7	19.23	15 47.80	8.68	2 12.79	0.397	4 43 33.92
4	We	4 45 27.39	10.268	22 20 33.7	18.26	15 47.68	8.67	2 3.09	0.412	4 47 30.48
5	Th	4 49 33.99	10.282	22 27 40.2	17.28	15 47.55	8.67	1 53.04	0.426	4 51 27.04
6	Fr	4 53 40.92	10.295	+22 34 23.2	+16.30	15 47.44	8.67	+1 42.67	−0.438	4 55 23.59
7	Sa	4 57 48.15	10.308	22 40 42.5	15.31	15 47.32	8.67	1 32.00	0.451	4 59 20.15
8	Su	5 1 55.68	10.319	22 46 37.9	14.31	15 47.21	8.67	1 21.03	0.463	5 3 16.71
9	Mo	5 6 3.47	10.330	22 52 9.4	13.31	15 47.11	8.67	1 9.79	0.474	5 7 13.26
10	Tu	5 10 11.52	10.341	22 57 16.8	12.30	15 47.00	8.67	0 58.30	0.484	5 11 9.82
11	We	5 14 19.81	10.350	+23 1 59.9	+11.29	15 46.90	8.67	+0 46.57	−0.493	5 15 6.38
12	Th	5 18 28.31	10.358	23 6 18.8	10.28	15 46.81	8.67	0 34.63	0.502	5 19 2.94
13	Fr	5 22 37.01	10.366	23 10 13.3	9.26	15 46.71	8.67	0 22.49	0.510	5 22 59.49
14	Sa	5 26 45.89	10.373	23 13 43.4	8.24	15 46.62	8.66	+0 10.16	0.517	5 26 56.05
15	Su	5 30 54.93	10.380	23 16 48.9	7.21	15 46.53	8.66	−0 2.32	0.523	5 30 52.61
16	Mo	5 35 4.11	10.385	+23 19 29.7	+ 6.19	15 46.45	8.66	−0 14.94	−0.529	5 34 49.17
17	Tu	5 39 13.42	10.390	23 21 45.9	5.16	15 46.37	8.66	0 27.69	0.534	5 38 45.72
18	We	5 43 22.83	10.394	23 23 37.3	4.13	15 46.29	8.66	0 40.55	0.538	5 42 42.28
19	Th	5 47 32.32	10.397	23 25 4.0	3.09	15 46.22	8.66	0 53.49	0.541	5 46 38.84
20	Fr	5 51 41.88	10.399	23 26 5.8	2.06	15 46.15	8.66	1 6.49	0.543	5 50 35.40
21	Sa	5 55 51.48	10.401	+23 26 42.9	+ 1.03	15 46.08	8.66	−1 19.53	−0.544	5 54 31.95
22	Su	6 0 1.10	10.401	23 26 55.1	− 0.01	15 46.02	8.66	1 32.59	0.544	5 58 28.51
23	Mo	6 4 10.71	10.400	23 26 42.5	1.04	15 45.96	8.66	1 45.64	0.543	6 2 25.07
24	Tu	6 8 20.28	10.398	23 26 5.0	2.08	15 45.91	8.66	1 58.66	0.541	6 6 21.63
25	We	6 12 29.80	10.395	23 25 2.7	3.11	15 45.86	8.66	2 11.62	0.538	6 10 18.18
26	Th	6 16 39.23	10.391	+23 23 35.7	− 4.14	15 45.82	8.66	−2 24.49	−0.534	6 14 14.74
27	Fr	6 20 48.55	10.385	23 21 44.0	5.17	15 45.79	8.66	2 37.25	0.529	6 18 11.30
28	Sa	6 24 57.72	10.379	23 19 27.7	6.19	15 45.76	8.66	2 49.87	0.522	6 22 7.86
29	Su	6 29 6.72	10.371	23 16 46.7	7.22	15 45.73	8.66	3 2.31	0.514	6 26 4.41
30	Mo	6 33 15.52	10.362	23 13 41.3	8.23	15 45.71	8.66	3 14.55	0.506	6 30 0.97
y 1	Tu	6 37 24.09	10.352	+23 10 11.5	− 9.25	15 45.70	8.66	−3 26.57	−0.496	6 33 57.53
2	We	6 41 32.41	10.341	+23 6 17.3	−10.26	15 45.69	8.66	−3 38.33	−0.485	6 37 54.08

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 26′ ″	h m s
May 17	137	55 31 44.5	144.45	+0.40	0.004 9351	+37.5	18.73	+14.63	20.23	55.09	20 20 7.10
18	138	56 29 30.7	144.40	0.52	0.005 0248	37.1	18.86	14.64	20.23	55.06	20 16 11.19
19	139	57 27 15.6	144.35	0.63	0.005 1134	36.7	19.00	14.65	20.22	55.03	20 12 15.28
20	140	58 24 59.4	144.30	0.72	0.005 2008	36.2	19.14	14.66	20.22	55.01	20 8 19.37
21	141	59 22 42.1	144.26	0.78	0.005 2870	35.6	19.28	14.67	20.22	54.98	20 4 23.46
22	142	60 20 23.7	144.21	+0.80	0.005 3719	+35.0	19.41	+14.68	20.21	54.96	20 0 27.55
23	143	61 18 4.3	144.17	0.79	0.005 4552	34.4	19.55	14.69	20.21	54.93	19 56 31.64
24	144	62 15 44.0	144.13	0.75	0.005 5369	33.6	19.69	14.71	20.21	54.91	19 52 35.73
25	145	63 13 22.7	144.09	0.68	0.005 6167	32.8	19.83	14.72	20.20	54.88	19 48 39.82
26	146	64 11 0.4	144.05	0.59	0.005 6945	32.0	19.97	14.74	20.20	54.86	19 44 43.91
27	147	65 8 37.2	144.01	+0.47	0.005 7702	+31.1	20.10	+14.76	20.19	54.84	19 40 48.00
28	148	66 6 13.0	143.97	0.34	0.005 8436	30.1	20.24	14.78	20.19	54.81	19 36 52.09
29	149	67 3 47.8	143.92	0.21	0.005 9146	29.1	20.38	14.80	20.19	54.79	19 32 56.18
30	150	68 1 21.4	143.88	+0.07	0.005 9833	28.1	20.52	14.82	20.18	54.77	19 29 0.27
31	151	68 58 53.9	143.83	−0.07	0.006 0495	27.1	20.65	14.84	20.18	54.75	19 25 4.36
June 1	152	69 56 25.2	143.78	−0.18	0.006 1134	+26.2	20.79	+14.87	20.18	54.73	19 21 8.45
2	153	70 53 55.2	143.73	0.26	0.006 1751	25.2	20.93	14.89	20.18	54.71	19 17 12.54
3	154	71 51 24.0	143.68	0.32	0.006 2346	24.4	21.07	14.91	20.17	54.69	19 13 16.62
4	155	72 48 51.6	143.62	0.35	0.006 2921	23.5	21.20	14.94	20.17	54.67	19 9 20.71
5	156	73 46 18.0	143.57	0.35	0.006 3476	22.8	21.34	14.97	20.17	54.65	19 5 24.80
6	157	74 43 43.1	143.52	−0.32	0.006 4014	+22.0	21.48	+14.99	20.16	54.63	19 1 28.89
7	158	75 41 7.1	143.48	0.26	0.006 4534	21.3	21.62	15.02	20.16	54.61	18 57 32.98
8	159	76 38 30.1	143.44	0.18	0.006 5038	20.7	21.75	15.05	20.16	54.59	18 53 37.07
9	160	77 35 52.0	143.39	−0.07	0.006 5526	20.0	21.89	15.08	20.16	54.57	18 49 41.16
10	161	78 33 12.9	143.35	+0.05	0.006 5999	19.4	22.03	15.11	20.16	54.56	18 45 45.25
11	162	79 30 32.9	143.32	+0.17	0.006 6457	+18.8	22.17	+15.14	20.15	54.54	18 41 49.33
12	163	80 27 52.1	143.29	0.30	0.006 6901	18.2	22.30	15.17	20.15	54.53	18 37 53.42
13	164	81 25 10.5	143.25	0.43	0.006 7332	17.6	22.44	15.20	20.15	54.51	18 33 57.51
14	165	82 22 28.2	143.22	0.56	0.006 7748	17.0	22.58	15.23	20.15	54.50	18 30 1.60
15	166	83 19 45.4	143.20	0.67	0.006 8150	16.5	22.72	15.26	20.15	54.48	18 26 5.69
16	167	84 17 2.0	143.18	+0.76	0.006 8538	+15.9	22.85	+15.29	20.14	54.47	18 22 9.78
17	168	85 14 18.2	143.17	0.82	0.006 8912	15.2	22.99	15.32	20.14	54.46	18 18 13.86
18	169	86 11 34.0	143.16	0.85	0.006 9270	14.6	23.13	15.35	20.14	54.45	18 14 17.95
19	170	87 8 49.6	143.14	0.86	0.006 9611	13.9	23.27	15.39	20.14	54.43	18 10 22.04
20	171	88 6 5.0	143.14	0.83	0.006 9935	13.1	23.41	15.42	20.14	54.42	18 6 26.13
21	172	89 3 20.2	143.13	+0.77	0.007 0240	+12.3	23.54	+15.45	20.14	54.41	18 2 30.22
22	173	90 0 35.3	143.13	0.69	0.007 0525	11.4	23.68	15.48	20.13	54.40	17 58 34.31
23	174	90 57 50.3	143.12	0.58	0.007 0788	10.5	23.82	15.52	20.13	54.40	17 54 38.40
24	175	91 55 5.2	143.12	0.45	0.007 1028	9.5	23.96	15.55	20.13	54.39	17 50 42.48
25	176	92 52 20.0	143.11	0.32	0.007 1242	8.4	24.09	15.58	20.13	54.38	17 46 46.57
26	177	93 49 34.7	143.11	+0.18	0.007 1431	+ 7.3	24.23	+15.61	20.13	54.37	17 42 50.66
27	178	94 46 49.2	143.10	+0.04	0.007 1594	6.2	24.37	15.65	20.13	54.37	17 38 54.75
28	179	95 44 3.6	143.09	−0.08	0.007 1729	5.1	24.51	15.68	20.13	54.36	17 34 58.84
29	180	96 41 17.7	143.08	0.17	0.007 1838	4.0	24.64	15.71	20.13	54.36	17 31 2.93
30	181	97 38 31.5	143.07	0.24	0.007 1920	2.9	24.78	15.74	20.13	54.35	17 27 7.02
July 1	182	98 35 45.0	143.06	−0.28	0.007 1977	+ 1.9	24.92	+15.77	20.13	54.35	17 23 11.10
2	183	99 32 58.2	143.04	−0.30	0.007 2009	+ 0.9	25.06	+15.80	20.13	54.34	17 19 15.19

SUN, 1919.

FOR GREENWICH MEAN NOON.

Date.		Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
			h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
July	1	Tu	6 37 24.09	10.352	+23 10 11.5	− 9.25	15 45.70	8.66	−3 26.57	−0.496	6 33 57.53
	2	We	6 41 32.41	10.341	23 6 17.3	10.26	15 45.69	8.66	3 38.33	0.485	6 37 54.08
	3	Th	6 45 40.46	10.329	23 1 59.0	11.26	15 45.69	8.66	3 49.82	0.473	6 41 50.64
	4	Fr	6 49 48.21	10.316	22 57 16.6	12.27	15 45.69	8.66	4 1.01	0.460	6 45 47.20
	5	Sa	6 53 55.64	10.302	22 52 10.2	13.26	15 45.70	8.66	4 11.88	0.446	6 49 43.76
	6	Su	6 58 2.72	10.288	+22 46 40.0	−14.25	15 45.71	8.66	−4 22.41	−0.432	6 53 40.31
	7	Mo	7 2 9.45	10.273	22 40 46.1	15.24	15 45.73	8.66	4 32.59	0.416	6 57 36.87
	8	Tu	7 6 15.81	10.257	22 34 28.6	16.22	15 45.75	8.66	4 42.39	0.400	7 1 33.43
	9	We	7 10 21.78	10.240	22 27 47.7	17.19	15 45.78	8.66	4 51.79	0.383	7 5 29.98
	10	Th	7 14 27.34	10.223	22 20 43.5	18.16	15 45.80	8.66	5 0.79	0.366	7 9 26.54
	11	Fr	7 18 32.47	10.205	+22 13 16.2	−19.12	15 45.83	8.66	−5 9.37	−0.349	7 13 23.10
	12	Sa	7 22 37.17	10.186	22 5 26.0	20.07	15 45.87	8.66	5 17.52	0.330	7 17 19.65
	13	Su	7 26 41.42	10.168	21 57 13.1	21.01	15 45.90	8.66	5 25.21	0.311	7 21 16.21
	14	Mo	7 30 45.21	10.148	21 48 37.5	21.95	15 45.94	8.66	5 32.44	0.292	7 25 12.77
	15	Tu	7 34 48.53	10.128	21 39 39.6	22.88	15 45.99	8.66	5 39.20	0.272	7 29 9.32
	16	We	7 38 51.37	10.108	+21 30 19.4	−23.80	15 46.03	8.66	−5 45.49	−0.252	7 33 5.88
	17	Th	7 42 53.72	10.088	21 20 37.2	24.71	15 46.08	8.66	5 51.28	0.231	7 37 2.44
	18	Fr	7 46 55.57	10.067	21 10 33.2	25.62	15 46.14	8.66	5 56.57	0.210	7 40 58.99
	19	Sa	7 50 56.91	10.045	21 0 7.6	26.51	15 46.20	8.66	6 1.36	0.189	7 44 55.55
	20	Su	7 54 57.73	10.023	20 49 20.6	27.40	15 46.26	8.66	6 5.63	0.167	7 48 52.11
	21	Mo	7 58 58.03	10.001	+20 38 12.5	−28.28	15 46.32	8.66	−6 9.37	−0.145	7 52 48.66
	22	Tu	8 2 57.79	9.979	20 26 43.4	29.14	15 46.39	8.66	6 12.58	0.122	7 56 45.22
	23	We	8 6 57.01	9.956	20 14 53.7	30.00	15 46.47	8.66	6 15.24	0.099	8 0 41.78
	24	Th	8 10 55.67	9.932	20 2 43.6	30.84	15 46.55	8.66	6 17.34	0.076	8 4 38.33
	25	Fr	8 14 53.76	9.908	19 50 13.4	31.67	15 46.63	8.66	6 18.87	0.052	8 8 34.89
	26	Sa	8 18 51.27	9.884	+19 37 23.3	−32.50	15 46.72	8.67	−6 19.83	−0.028	8 12 31.44
	27	Su	8 22 48.20	9.860	19 24 13.7	33.30	15 46.82	8.67	6 20.20	−0.003	8 16 28.00
	28	Mo	8 26 44.53	9.835	19 10 44.8	34.10	15 46.92	8.67	6 19.98	+0.022	8 20 24.56
	29	Tu	8 30 40.26	9.809	18 56 57.0	34.89	15 47.03	8.67	6 19.14	0.047	8 24 21.11
	30	We	8 34 35.37	9.783	18 42 50.4	35.66	15 47.14	8.67	6 17.70	0.073	8 28 17.67
	31	Th	8 38 29.86	9.758	+18 28 25.4	−36.42	15 47.26	8.67	−6 15.64	+0.099	8 32 14.22
Aug.	1	Fr	8 42 23.74	9.732	18 13 42.3	37.17	15 47.38	8.67	6 12.96	0.125	8 36 10.78
	2	Sa	8 46 16.99	9.706	17 58 41.4	37.90	15 47.51	8.67	6 9.66	0.151	8 40 7.33
	3	Su	8 50 9.62	9.630	17 43 23.0	38.63	15 47.64	8.67	6 5.73	0.177	8 44 3.89
	4	Mo	8 54 1.63	9.654	17 27 47.3	39.34	15 47.78	8.68	6 1.18	0.203	8 48 0.44
	5	Tu	8 57 53.01	9.628	+17 11 54.7	−40.04	15 47.92	8.68	−5 56.01	+0.228	8 51 57.00
	6	We	9 1 43.78	9.603	16 55 45.4	40.73	15 48.06	8.68	5 50.23	0.254	8 55 53.55
	7	Th	9 5 33.94	9.577	16 39 19.7	41.41	15 48.21	8.68	5 43.83	0.279	8 59 50.11
	8	Fr	9 9 23.49	9.552	16 22 38.0	42.07	15 48.36	8.68	5 36.83	0.303	9 3 46.66
	9	Sa	9 13 12.44	9.527	16 5 40.5	42.72	15 48.51	8.68	5 29.23	0.329	9 7 43.22
	10	Su	9 17 0.80	9.503	+15 48 27.4	−43.36	15 48.67	8.68	−5 21.03	+0.354	9 11 39.77
	11	Mo	9 20 48.58	9.479	15 30 59.2	43.99	15 48.82	8.68	5 12.26	0.378	9 15 36.33
	12	Tu	9 24 35.79	9.455	15 13 16.0	44.61	15 48.98	8.69	5 2.91	0.401	9 19 32.88
	13	We	9 28 22.43	9.432	14 55 18.2	45.21	15 49.14	8.69	4 53.00	0.424	9 23 29.44
	14	Th	9 32 8.53	9.410	14 37 6.1	45.80	15 49.31	8.69	4 42.54	0.447	9 27 25.99
	15	Fr	9 35 54.09	9.387	+14 18 39.9	−46.38	15 49.48	8.69	−4 31.54	+0.469	9 31 22.54
	16	Sa	9 39 39.12	9.365	+13 59 59.9	−46.95	15 49.65	8.69	−4 20.02	+0.491	9 35 19.10

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 26′ ″	h m s
July 1	182	98 35 45.0	143.06	−0.28	0.007 1977	+ 1.9	24.92	+15.77	20.13	54.35	17 23 11.10
2	183	99 32 58.2	143.04	0.30	0.007 2009	+ 0.9	25.06	15.80	20.13	54.34	17 19 15.19
3	184	100 30 11.1	143.03	0.28	0.007 2018	− 0.1	25.19	15.83	20.13	54.34	17 15 19.28
4	185	101 27 23.7	143.02	0.23	0.007 2005	1.0	25.33	15.86	20.13	54.34	17 11 23.37
5	186	102 24 36.0	143.01	0.16	0.007 1970	1.9	25.47	15.89	20.13	54.34	17 7 27.46
6	187	103 21 48.1	143.00	−0.07	0.007 1916	− 2.6	25.61	+15.92	20.13	54.33	17 3 31.55
7	188	104 18 59.9	142.99	+0.04	0.007 1843	3.4	25.74	15.95	20.13	54.33	16 59 35.64
8	189	105 16 11.7	142.99	0.16	0.007 1752	4.1	25.88	15.97	20.13	54.33	16 55 39.73
9	190	106 13 23.3	142.99	0.28	0.007 1644	4.9	26.02	16.00	20.13	54.33	16 51 43.82
10	191	107 10 35.0	142.99	0.40	0.007 1519	5.5	26.16	16.02	20.13	54.34	16 47 47.90
11	192	108 7 46.6	142.99	+0.52	0.007 1378	− 6.2	26.30	+16.05	20.13	54.34	16 43 51.99
12	193	109 4 58.5	143.00	0.64	0.007 1222	6.8	26.43	16.07	20.13	54.34	16 39 56.08
13	194	110 2 10.5	143.01	0.74	0.007 1052	7.4	26.57	16.10	20.13	54.34	16 36 0.17
14	195	110 59 22.8	143.02	0.80	0.007 0867	8.0	26.71	16.12	20.13	54.34	16 32 4.26
15	196	111 56 35.5	143.04	0.84	0.007 0668	8.6	26.85	16.14	20.13	54.35	16 28 8.35
16	197	112 53 48.7	143.06	+0.85	0.007 0454	− 9.2	26.98	+16.16	20.14	54.35	16 24 12.44
17	198	113 51 2.4	143.09	0.83	0.007 0224	9.9	27.12	16.18	20.14	54.35	16 20 16.53
18	199	114 48 16.8	143.11	0.78	0.006 9978	10.6	27.26	16.20	20.14	54.36	16 16 20.62
19	200	115 45 31.9	143.14	0.70	0.006 9715	11.3	27.40	16.21	20.14	54.37	16 12 24.71
20	201	116 42 47.8	143.18	0.60	0.006 9434	12.1	27.53	16.23	20.14	54.37	16 8 28.80
21	202	117 40 4.5	143.21	+0.48	0.006 9133	−13.0	27.67	+16.25	20.14	54.38	16 4 32.89
22	203	118 37 22.0	143.25	0.34	0.006 8810	13.9	27.81	16.26	20.14	54.38	16 0 36.98
23	204	119 34 40.4	143.28	0.20	0.006 8465	14.9	27.95	16.27	20.14	54.39	15 56 41.07
24	205	120 31 59.6	143.32	+0.06	0.006 8097	15.9	28.08	16.28	20.15	54.39	15 52 45.16
25	206	121 29 19.7	143.35	−0.07	0.006 7704	16.9	28.22	16.29	20.15	54.40	15 48 49.25
26	207	122 26 40.5	143.39	−0.17	0.006 7285	−18.0	28.36	+16.30	20.15	54.41	15 44 53.34
27	208	123 24 2.1	143.41	0.25	0.006 6841	19.0	28.50	16.31	20.15	54.41	15 40 57.43
28	209	124 21 24.4	143.44	0.30	0.006 6371	20.1	28.63	16.32	20.16	54.42	15 37 1.52
29	210	125 18 47.3	143.47	0.32	0.006 5877	21.1	28.77	16.32	20.16	54.43	15 33 5.61
30	211	126 16 10.9	143.49	0.30	0.006 5358	22.1	28.91	16.33	20.16	54.44	15 29 9.70
31	212	127 13 35.1	143.52	−0.26	0.006 4816	−23.0	29.05	+16.33	20.16	54.45	15 25 13.79
Aug. 1	213	128 10 59.9	143.55	0.19	0.006 4253	23.9	29.18	16.33	20.16	54.46	15 21 17.88
2	214	129 8 25.4	143.57	−0.10	0.006 3668	24.8	29.32	16.33	20.17	54.47	15 17 21.97
3	215	130 5 51.5	143.60	0.00	0.006 3064	25.5	29.46	16.33	20.17	54.48	15 13 26.06
4	216	131 3 18.2	143.63	+0.11	0.006 2442	26.3	29.60	16.33	20.17	54.49	15 9 30.15
5	217	132 0 45.7	143.66	+0.22	0.006 1803	−27.0	29.74	+16.33	20.18	54.50	15 5 34.24
6	218	132 58 13.9	143.69	0.34	0.006 1147	27.6	29.87	16.32	20.18	54.50	15 1 38.33
7	219	133 55 42.9	143.72	0.46	0.006 0476	28.2	30.01	16.31	20.18	54.51	14 57 42.42
8	220	134 53 12.8	143.76	0.56	0.005 9791	28.8	30.15	16.30	20.19	54.52	14 53 46.51
9	221	135 50 43.5	143.80	0.65	0.005 9093	29.3	30.29	16.29	20.19	54.53	14 49 50.60
10	222	136 48 15.2	143.84	+0.72	0.005 8383	−29.8	30.42	+16.28	20.19	54.54	14 45 54.70
11	223	137 45 48.0	143.89	0.76	0.005 7662	30.3	30.56	16.27	20.19	54.55	14 41 58.79
12	224	138 43 21.8	143.94	0.77	0.005 6930	30.7	30.70	16.26	20.20	54.56	14 38 2.88
13	225	139 40 57.0	143.99	0.75	0.005 6187	31.2	30.84	16.24	20.20	54.57	14 34 6.97
14	226	140 38 33.4	144.05	0.71	0.005 5434	31.6	30.97	16.23	20.20	54.58	14 30 11.06
15	227	141 36 11.3	144.11	+0.64	0.005 4670	−32.1	31.11	+16.21	20.21	54.59	14 26 15.15
16	228	142 33 50.6	144.17	+0.53	0.005 3894	−32.6	31.25	+16.19	20.21	54.60	14 22 19.24

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
Aug. 16	Sa	9 39 39.12	9.365	+13 59 59.9	−46.95	15 49.65	8.69	− 4 20.02	+0.491	9 35 19.10
17	Su	9 43 23.64	9.345	13 41 6.4	47.50	15 49.82	8.69	4 7.99	0.512	9 39 15.65
18	Mo	9 47 7.67	9.324	13 21 59.8	48.04	15 49.99	8.70	3 55.46	0.532	9 43 12.21
19	Tu	9 50 51.20	9.304	13 2 40.4	48.57	15 50.17	8.70	3 42.44	0.552	9 47 8.76
20	We	9 54 34.26	9.284	12 43 8.5	49.09	15 50.36	8.70	3 28.95	0.572	9 51 5.31
21	Th	9 58 16.85	9.265	+12 23 24.3	−49.59	15 50.54	8.70	− 3 14.99	+0.591	9 55 1.87
22	Fr	10 1 58.99	9.246	12 3 28.3	50.08	15 50.73	8.70	3 0.57	0.610	9 58 58.42
23	Sa	10 5 40.68	9.228	11 43 20.8	50.55	15 50.93	8.70	2 45.70	0.629	10 2 54.97
24	Su	10 9 21.93	9.210	11 23 2.1	51.01	15 51.13	8.71	2 30.40	0.647	10 6 51.53
25	Mo	10 13 2.75	9.192	11 2 32.6	51.45	15 51.33	8.71	2 14.67	0.664	10 10 48.08
26	Tu	10 16 43.15	9.175	+10 41 52.6	−51.88	15 51.54	8.71	− 1 58.52	+0.682	10 14 44.63
27	We	10 20 23.14	9.158	10 21 2.4	52.30	15 51.75	8.71	1 41.96	0.698	10 18 41.19
28	Th	10 24 2.74	9.142	10 0 2.5	52.70	15 51.96	8.71	1 25.00	0.715	10 22 37.74
29	Fr	10 27 41.95	9.126	9 38 53.1	53.09	15 52.18	8.72	1 7.66	0.730	10 26 34.29
30	Sa	10 31 20.79	9.111	9 17 34.5	53.46	15 52.41	8.72	0 49.95	0.745	10 30 30.85
31	Su	10 34 59.28	9.096	+ 8 56 7.1	−53.82	15 52.64	8.72	− 0 31.88	+0.760	10 34 27.40
Sept. 1	Mo	10 38 37.42	9.082	8 34 31.2	54.17	15 52.87	8.72	− 0 13.46	0.774	10 38 23.95
2	Tu	10 42 15.23	9.069	8 12 47.1	54.50	15 53.10	8.72	+ 0 5.28	0.787	10 42 20.51
3	We	10 45 52.73	9.056	7 50 55.2	54.82	15 53.34	8.73	0 24.33	0.800	10 46 17.06
4	Th	10 49 29.94	9.045	7 28 55.8	55.13	15 53.57	8.73	0 43.67	0.812	10 50 13.61
5	Fr	10 53 6.88	9.034	+ 7 6 49.2	−55.42	15 53.81	8.73	+ 1 3.29	+0.823	10 54 10.16
6	Sa	10 56 43.56	9.023	6 44 35.7	55.70	15 54.06	8.73	1 23.16	0.833	10 58 6.72
7	Su	11 0 20.00	9.014	6 22 15.7	55.97	15 54.30	8.73	1 43.27	0.843	11 2 3.27
8	Mo	11 3 56.22	9.005	5 59 49.3	56.23	15 54.54	8.74	2 3.60	0.851	11 5 59.82
9	Tu	11 7 32.25	8.998	5 37 17.0	56.47	15 54.79	8.74	2 24.13	0.859	11 9 56.38
10	We	11 11 8.11	8.991	+ 5 14 39.0	−56.70	15 55.04	8.74	+ 2 44.82	+0.865	11 13 52.93
11	Th	11 14 43.82	8.985	4 51 55.7	56.91	15 55.28	8.74	3 5.66	0.871	11 17 49.48
12	Fr	11 18 19.40	8.980	4 29 7.3	57.12	15 55.53	8.75	3 26.63	0.876	11 21 46.03
13	Sa	11 21 54.88	8.976	4 6 14.1	57.31	15 55.78	8.75	3 47.70	0.880	11 25 42.58
14	Su	11 25 30.28	8.974	3 43 16.5	57.49	15 56.03	8.75	4 8.85	0.883	11 29 39.14
15	Mo	11 29 5.63	8.972	+ 3 20 14.8	−57.65	15 56.28	8.75	+ 4 30.06	+0.885	11 33 35.69
16	Tu	11 32 40.95	8.971	2 57 9.3	57.80	15 56.53	8.75	4 51.30	0.885	11 37 32.24
17	We	11 36 16.25	8.971	2 34 0.3	57.94	15 56.78	8.76	5 12.55	0.886	11 41 28.79
18	Th	11 39 51.55	8.971	2 10 48.2	58.06	15 57.04	8.76	5 33.80	0.885	11 45 25.35
19	Fr	11 43 26.88	8.973	1 47 33.3	58.17	15 57.29	8.76	5 55.02	0.883	11 49 21.90
20	Sa	11 47 2.26	8.975	+ 1 24 16.0	−58.27	15 57.55	8.76	+ 6 16.20	+0.881	11 53 18.45
21	Su	11 50 37.70	8.978	1 0 56.6	58.35	15 57.81	8.77	6 37.31	0.878	11 57 15.00
22	Mo	11 54 13.21	8.982	0 37 35.5	58.41	15 58.08	8.77	6 58.35	0.875	12 1 11.56
23	Tu	11 57 48.82	8.986	+ 0 14 13.1	58.46	15 58.34	8.77	7 19.29	0.870	12 5 8.11
24	We	12 1 24.54	8.991	− 0 9 10.3	58.49	15 58.61	8.77	7 40.12	0.865	12 9 4.66
25	Th	12 5 0.39	8.997	− 0 32 34.4	−58.51	15 58.88	8.78	+ 8 0.82	+0.860	12 13 1.21
26	Fr	12 8 36.38	9.003	0 55 58.7	58.51	15 59.15	8.78	8 21.38	0.854	12 16 57.76
27	Sa	12 12 12.54	9.010	1 19 22.9	58.50	15 59.43	8.78	8 41.78	0.846	12 20 54.32
28	Su	12 15 48.88	9.018	1 42 46.7	58.48	15 59.71	8.78	9 1.99	0.838	12 24 50.87
29	Mo	12 19 25.42	9.027	2 6 9.6	58.43	15 59.99	8.79	9 22.00	0.830	12 28 47.42
30	Tu	12 23 2.18	9.036	− 2 29 31.4	−58.38	16 0.27	8.79	+ 9 41.80	+0.820	12 32 43.97
Oct. 1	We	12 26 39.17	9.046	− 2 52 51.7	−58.31	16 0.55	8.79	+10 1.36	+0.810	12 36 40.53

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 26′ ″	h m s
Aug. 16	228	142 33 50.6	144.17	+0.53	0.005 3894	−32.6	31.25	+16.19	20.21	54.60	14 22 19.24
17	229	143 31 31.5	144.24	0.41	0.005 3106	33.2	31.39	16.17	20.22	54.61	14 18 23.34
18	230	144 29 14.0	144.30	0.27	0.005 2303	33.8	31.52	16.15	20.22	54.62	14 14 27.43
19	231	145 26 58.2	144.38	+0.13	0.005 1485	34.4	31.66	16.12	20.22	54.62	14 10 31.52
20	232	146 24 44.0	144.45	0.00	0.005 0651	35.1	31.80	16.10	20.23	54.63	14 6 35.61
21	233	147 22 31.5	144.51	−0.13	0.004 9800	−35.9	31.94	+16.07	20.23	54.64	14 2 39.70
22	234	148 20 20.7	144.58	0.23	0.004 8930	36.6	32.07	16.04	20.23	54.65	13 58 43.80
23	235	149 18 11.5	144.65	0.30	0.004 8041	37.4	32.21	16.02	20.24	54.66	13 54 47.89
24	236	150 16 3.8	144.71	0.35	0.004 7133	38.3	32.35	15.99	20.24	54.67	13 50 51.98
25	237	151 13 57.8	144.78	0.38	0.004 6204	39.1	32.49	15.95	20.25	54.67	13 46 56.07
26	238	152 11 53.2	144.84	−0.37	0.004 5255	−39.9	32.63	+15.92	20.25	54.68	13 43 0.17
27	239	153 9 50.2	144.90	0.33	0.004 4287	40.7	32.76	15.89	20.26	54.68	13 39 4.26
28	240	154 7 48.5	144.96	0.26	0.004 3301	41.5	32.90	15.85	20.26	54.69	13 35 8.35
29	241	155 5 48.3	145.02	0.18	0.004 2297	42.2	33.04	15.82	20.27	54.70	13 31 12.44
30	242	156 3 49.5	145.08	−0.08	0.004 1276	42.8	33.18	15.78	20.27	54.70	13 27 16.54
31	243	157 1 52.0	145.14	+0.03	0.004 0241	−43.4	33.31	+15.74	20.28	54.71	13 23 20.63
Sept. 1	244	157 59 56.0	145.19	0.15	0.003 9191	44.0	33.45	15.70	20.28	54.71	13 19 24.72
2	245	158 58 1.3	145.25	0.27	0.003 8128	44.5	33.59	15.66	20.29	54.72	13 15 28.82
3	246	159 56 8.1	145.31	0.38	0.003 7053	45.0	33.73	15.62	20.29	54.72	13 11 32.91
4	247	160 54 16.3	145.37	0.49	0.003 5968	45.4	33.86	15.58	20.30	54.72	13 7 37.00
5	248	161 52 25.9	145.43	+0.58	0.003 4874	−45.7	34.00	+15.54	20.30	54.73	13 3 41.10
6	249	162 50 37.1	145.50	0.65	0.003 3772	46.0	34.14	15.49	20.31	54.73	12 59 45.19
7	250	163 48 49.8	145.56	0.70	0.003 2664	46.3	34.28	15.45	20.31	54.73	12 55 49.28
8	251	164 47 4.0	145.63	0.72	0.003 1551	46.5	34.41	15.40	20.32	54.73	12 51 53.38
9	252	165 45 20.0	145.70	0.70	0.003 0433	46.6	34.55	15.36	20.32	54.73	12 47 57.47
10	253	166 43 37.7	145.78	+0.65	0.002 9312	−46.7	34.69	+15.31	20.33	54.73	12 44 1.56
11	254	167 41 57.2	145.85	0.58	0.002 8189	46.8	34.83	15.26	20.33	54.73	12 40 5.66
12	255	168 40 18.7	145.94	0.49	0.002 7064	47.0	34.96	15.21	20.34	54.73	12 36 9.75
13	256	169 38 42.1	146.02	0.37	0.002 5935	47.1	35.10	15.16	20.34	54.73	12 32 13.84
14	257	170 37 7.7	146.11	0.24	0.002 4802	47.3	35.24	15.11	20.35	54.73	12 28 17.94
15	258	171 35 35.4	146.20	+0.10	0.002 3666	−47.5	35.38	+15.06	20.35	54.73	12 24 22.03
16	259	172 34 5.2	146.29	−0.03	0.002 2523	47.7	35.51	15.01	20.36	54.72	12 20 26.12
17	260	173 32 37.3	146.38	0.15	0.002 1374	48.0	35.65	14.96	20.36	54.72	12 16 30.22
18	261	174 31 11.6	146.48	0.26	0.002 0218	48.4	35.79	14.91	20.37	54.71	12 12 34.31
19	262	175 29 48.2	146.57	0.34	0.001 9052	48.8	35.93	14.86	20.37	54.71	12 8 38.40
20	263	176 28 26.9	146.66	−0.39	0.001 7877	−49.2	36.07	+14.81	20.38	54.70	12 4 42.50
21	264	177 27 7.7	146.75	0.41	0.001 6692	49.6	36.20	14.76	20.39	54.70	12 0 46.59
22	265	178 25 50.7	146.83	0.41	0.001 5495	50.1	36.34	14.70	20.39	54.69	11 56 50.68
23	266	179 24 35.7	146.92	0.38	0.001 4288	50.5	36.48	14.65	20.40	54.68	11 52 54.78
24	267	180 23 22.8	147.00	0.31	0.001 3071	51.0	36.62	14.60	20.40	54.67	11 48 58.87
25	268	181 22 11.8	147.08	−0.22	0.001 1843	−51.4	36.75	+14.55	20.41	54.66	11 45 2.96
26	269	182 21 2.7	147.16	−0.12	0.001 0606	51.7	36.89	14.49	20.41	54.65	11 41 7.06
27	270	183 19 55.5	147.24	0.00	0.000 9360	52.1	37.03	14.44	20.42	54.64	11 37 11.15
28	271	184 18 50.2	147.31	+0.13	0.000 8105	52.4	37.17	14.39	20.43	54.63	11 33 15.25
29	272	185 17 46.6	147.39	0.26	0.000 6845	52.6	37.30	14.34	20.43	54.62	11 29 19.34
30	273	186 16 44.9	147.46	+0.38	0.000 5580	−52.8	37.44	+14.29	20.44	54.61	11 25 23.44
Oct. 1	274	187 15 45.0	147.54	+0.49	0.000 4309	−53.0	37.58	+14.23	20.44	54.60	11 21 27.53

FOR GREENWICH MEAN NOON.

Date.		Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time. or Right Ascension of Mean Sun.
			h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
Oct.	1	We	12 26 39.17	9.046	– 2 52 51.7	–58.31	16 0.55	8.79	+10 1.36	+0.810	12 36 40.53
	2	Th	12 30 16.42	9.058	3 16 10.2	58.23	16 0.83	8.79	10 20.66	0.798	12 40 37.08
	3	Fr	12 33 53.95	9.070	3 39 26.4	58.12	16 1.11	8.80	10 39.68	0.787	12 44 33.63
	4	Sa	12 37 31.77	9.082	4 2 40.0	58.01	16 1.39	8.80	10 58.41	0.774	12 48 30.18
	5	Su	12 41 9.91	9.096	4 25 50.7	57.88	16 1.68	8.80	11 16.82	0.760	12 52 26.73
	6	Mo	12 44 48.39	9.111	– 4 48 58.1	–57.74	16 1.96	8.80	+11 34.90	+0.746	12 56 23.29
	7	Tu	12 48 27.23	9.126	5 12 1.9	57.58	16 2.24	8.81	11 52.61	0.730	13 0 19.84
	8	We	12 52 6.45	9.143	5 35 1.8	57.41	16 2.51	8.81	12 9.94	0.714	13 4 16.39
	9	Th	12 55 46.08	9.160	5 57 57.3	57.22	16 2.79	8.81	12 26.87	0.696	13 8 12.94
	10	Fr	12 59 26.14	9.179	6 20 48.2	57.02	16 3.07	8.81	12 43.36	0.678	13 12 9.50
	11	Sa	13 3 6.66	9.198	– 6 43 34.1	–56.80	16 3.34	8.82	+12 59.40	+0.658	13 16 6.05
	12	Su	13 6 47.65	9.218	7 6 14.7	56.58	16 3.62	8.82	13 14.95	0.638	13 20 2.60
	13	Mo	13 10 29.15	9.240	7 28 49.6	56.33	16 3.89	8.82	13 30.00	0.616	13 23 59.16
	14	Tu	13 14 11.18	9.262	7 51 18.5	56.07	16 4.16	8.82	13 44.53	0.594	13 27 55.71
	15	We	13 17 53.75	9.285	8 13 40.9	55.79	16 4.42	8.83	13 58.51	0.571	13 31 52.26
	16	Th	13 21 36.88	9.309	– 8 35 56.5	–55.50	16 4.69	8.83	+14 11.93	+0.547	13 35 48.81
	17	Fr	13 25 20.60	9.334	8 58 4.8	55.19	16 4.96	8.83	14 24.76	0.522	13 39 45.37
	18	Sa	13 29 4.92	9.359	9 20 5.6	54.87	16 5.23	8.83	14 37.00	0.497	13 43 41.92
	19	Su	13 32 49.85	9.385	9 41 58.4	54.53	16 5.49	8.84	14 48.62	0.471	13 47 38.47
	20	Mo	13 36 35.42	9.412	10 3 42.7	54.17	16 5.76	8.84	14 59.61	0.444	13 51 35.03
	21	Tu	13 40 21.63	9.439	–10 25 18.3	–53.80	16 6.03	8.84	+15 9.95	+0.417	13 55 31.58
	22	We	13 44 8.49	9.467	10 46 44.7	53.40	16 6.29	8.84	15 19.64	0.390	13 59 28.13
	23	Th	13 47 56.03	9.495	11 8 1.4	52.99	16 6.56	8.85	15 28.66	0.362	14 3 24.69
	24	Fr	13 51 44.24	9.523	11 29 8.0	52.56	16 6.82	8.85	15 37.00	0.333	14 7 21.24
	25	Sa	13 55 33.14	9.552	11 50 4.3	52.12	16 7.09	8.85	15 44.65	0.304	14 11 17.79
	26	Su	13 59 22.75	9.582	–12 10 49.6	–51.66	16 7.36	8.85	+15 51.60	+0.275	14 15 14.35
	27	Mo	14 3 13.07	9.612	12 31 23.7	51.18	16 7.62	8.86	15 57.83	0.245	14 19 10.90
	28	Tu	14 7 4.11	9.642	12 51 46.2	50.69	16 7.89	8.86	16 3.34	0.214	14 23 7.45
	29	We	14 10 55.89	9.673	13 11 56.5	50.17	16 8.15	8.86	16 8.11	0.183	14 27 4.01
	30	Th	14 14 48.42	9.704	13 31 54.4	49.65	16 8.41	8.86	16 12.14	0.152	14 31 0.56
	31	Fr	14 18 41.69	9.736	–13 51 39.4	–49.10	16 8.67	8.87	+16 15.42	+0.121	14 34 57.12
Nov.	1	Sa	14 22 35.73	9.768	14 11 11.1	48.54	16 8.93	8.87	16 17.94	0.089	14 38 53.67
	2	Su	14 26 30.54	9.800	14 30 29.0	47.96	16 9.19	8.87	16 19.68	0.056	14 42 50.22
	3	Mo	14 30 26.14	9.833	14 49 32.9	47.36	16 9.45	8.87	16 20.64	+0.024	14 46 46.78
	4	Tu	14 34 22.52	9.866	15 8 22.3	46.75	16 9.69	8.88	16 20.81	–0.010	14 50 43.33
	5	We	14 38 19.70	9.900	–15 26 56.8	–46.12	16 9.94	8.88	+16 20.18	–0.043	14 54 39.89
	6	Th	14 42 17.70	9.934	15 45 15.9	45.47	16 10.19	8.88	16 18.74	0.077	14 58 36.44
	7	Fr	14 46 16.52	9.968	16 3 19.4	44.82	16 10.43	8.88	16 16.48	0.112	15 2 33.00
	8	Sa	14 50 16.17	10.003	16 21 6.9	44.14	16 10.66	8.88	16 13.38	0.147	15 6 29.55
	9	Su	14 54 16.66	10.038	16 38 37.9	43.44	16 10.90	8.89	16 9.44	0.182	15 10 26.11
	10	Mo	14 58 18.01	10.074	–16 55 52.0	–42.73	16 11.13	8.89	+16 4.66	–0.217	15 14 22.66
	11	Tu	15 2 20.21	10.110	17 12 48.9	42.00	16 11.35	8.89	15 59.01	0.254	15 18 19.22
	12	We	15 6 23.28	10.146	17 29 28.1	41.26	16 11.57	8.89	15 52.49	0.290	15 22 15.77
	13	Th	15 10 27.22	10.182	17 45 49.4	40.51	16 11.79	8.89	15 45.11	0.326	15 26 12.33
	14	Fr	15 14 32.03	10.219	18 1 52.2	39.73	16 12.00	8.90	15 36.86	0.362	15 30 8.88
	15	Sa	15 18 37.71	10.255	–18 17 36.1	–38.93	16 12.21	8.90	+15 27.73	–0.398	15 34 5.44
	16	Su	15 22 44.25	10.291	–18 33 0.9	–38.13	16 12.42	8.90	+15 17.74	–0.434	15 38 1.99

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 26′ ″	h m s
Oct. 1	274	187 15 45.0	147.54	+0.49	0.000 4309	−53.0	37.58	+14.23	20.44	54.60	11 21 27.53
2	275	188 14 46.8	147.61	0.59	0.000 3036	53.1	37.72	14.18	20.45	54.58	11 17 31.62
3	276	189 13 50.4	147.69	0.67	0.000 1762	53.1	37.85	14.13	20.46	54.57	11 13 35.72
4	277	190 12 55.8	147.76	0.72	0.000 0487	53.1	37.99	14.08	20.46	54.56	11 9 39.81
5	278	191 12 2.9	147.84	0.75	9.999 9213	53.0	38.13	14.03	20.47	54.54	11 5 43.90
6	279	192 11 11.9	147.91	+0.74	9.999 7943	−52.8	38.27	+13.98	20.47	54.52	11 1 48.00
7	280	193 10 22.6	147.98	0.71	9.999 6677	52.6	38.40	13.93	20.48	54.51	10 57 52.09
8	281	194 9 35.3	148.07	0.65	9.999 5417	52.4	38.54	13.88	20.49	54.49	10 53 56.18
9	282	195 8 50.0	148.15	0.56	9.999 4164	52.0	38.68	13.84	20.49	54.47	10 50 0.28
10	283	196 8 6.7	148.24	0.44	9.999 2919	51.7	38.82	13.79	20.50	54.45	10 46 4.37
11	284	197 7 25.5	148.33	+0.31	9.999 1682	−51.4	38.96	+13.75	20.50	54.43	10 42 8.46
12	285	198 6 46.5	148.42	0.17	9.999 0453	51.1	39.09	13.70	20.51	54.41	10 38 12.56
13	286	199 6 9.7	148.52	+0.03	9.998 9231	50.8	39.23	13.66	20.52	54.39	10 34 16.65
14	287	200 5 35.3	148.61	−0.10	9.998 8015	50.5	39.37	13.62	20.52	54.37	10 30 20.74
15	288	201 5 3.2	148.71	0.21	9.998 6805	50.3	39.51	13.57	20.53	54.35	10 26 24.84
16	289	202 4 33.4	148.81	−0.30	9.998 5599	−50.2	39.64	+13.53	20.53	54.33	10 22 28.93
17	290	203 4 6.0	148.91	0.36	9.998 4396	50.1	39.78	13.49	20.54	54.31	10 18 33.02
18	291	204 3 40.9	149.00	0.39	9.998 3195	50.0	39.92	13.45	20.54	54.29	10 14 37.12
19	292	205 3 18.1	149.09	0.38	9.998 1996	50.0	40.06	13.42	20.55	54.26	10 10 41.21
20	293	206 2 57.5	149.19	0.34	9.998 0797	49.9	40.19	13.38	20.55	54.24	10 6 45.30
21	294	207 2 39.1	149.28	−0.28	9.997 9599	−49.9	40.33	+13.35	20.56	54.22	10 2 49.39
22	295	208 2 22.8	149.36	0.20	9.997 8402	49.9	40.47	13.31	20.57	54.19	9 58 53.49
23	296	209 2 8.5	149.45	−0.09	9.997 7205	49.9	40.61	13.28	20.57	54.17	9 54 57.58
24	297	210 1 56.3	149.53	+0.03	9.997 6008	49.8	40.74	13.25	20.58	54.14	9 51 1.67
25	298	211 1 46.0	149.61	0.16	9.997 4813	49.8	40.88	13.22	20.58	54.12	9 47 5.76
26	299	212 1 37.6	149.69	+0.29	9.997 3619	−49.7	41.02	+13.19	20.59	54.09	9 43 9.86
27	300	213 1 31.0	149.76	0.42	9.997 2428	49.5	41.16	13.16	20.59	54.06	9 39 13.95
28	301	214 1 26.2	149.83	0.54	9.997 1241	49.4	41.29	13.14	20.60	54.04	9 35 18.04
29	302	215 1 23.1	149.91	0.65	9.997 0059	49.1	41.43	13.11	20.61	54.01	9 31 22.13
30	303	216 1 21.7	149.98	0.73	9.996 8882	48.9	41.57	13.09	20.61	53.98	9 27 26.22
31	304	217 1 21.9	150.04	+0.79	9.996 7712	−48.6	41.71	+13.07	20.62	53.96	9 23 30.32
Nov. 1	305	218 1 23.8	150.11	0.82	9.996 6550	48.2	41.84	13.05	20.62	53.93	9 19 34.41
2	306	219 1 27.2	150.18	0.82	9.996 5399	47.7	41.98	13.03	20.63	53.90	9 15 38.50
3	307	220 1 32.2	150.24	0.79	9.996 4258	47.2	42.12	13.01	20.63	53.88	9 11 42.59
4	308	221 1 38.8	150.31	0.73	9.996 3131	46.6	42.26	13.00	20.64	53.85	9 7 46.68
5	309	222 1 47.0	150.37	+0.64	9.996 2019	−46.0	42.40	+12.98	20.64	53.82	9 3 50.77
6	310	223 1 56.8	150.44	0.53	9.996 0924	45.3	42.53	12.97	20.65	53.79	8 59 54.86
7	311	224 2 8.3	150.51	0.41	9.995 9846	44.5	42.67	12.96	20.65	53.76	8 55 58.96
8	312	225 2 21.6	150.59	0.27	9.995 8786	43.7	42.81	12.95	20.66	53.74	8 52 3.05
9	313	226 2 36.6	150.66	+0.13	9.995 7746	43.0	42.95	12.95	20.66	53.71	8 48 7.14
10	314	227 2 53.5	150.74	−0.01	9.995 6724	−42.2	43.08	+12.94	20.67	53.68	8 44 11.23
11	315	228 3 12.2	150.82	0.14	9.995 5720	41.5	43.22	12.94	20.67	53.65	8 40 15.32
12	316	229 3 33.0	150.90	0.24	9.995 4734	40.7	43.36	12.93	20.68	53.62	8 36 19.41
13	317	230 3 55.6	150.99	0.31	9.995 3764	40.1	43.50	12.93	20.68	53.59	8 32 23.50
14	318	231 4 20.3	151.07	0.35	9.995 2809	39.5	43.63	12.93	20.69	53.57	8 28 27.59
15	319	232 4 46.9	151.15	−0.36	9.995 1869	−38.9	43.77	+12.94	20.69	53.54	8 24 31.68
16	320	233 5 15.4	151.22	−0.34	9.995 0941	−38.4	43.91	+12.94	20.70	53.51	8 20 35.77

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m s
Nov. 16	Su	15 22 44.25	10.291	−18 33 0.9	−38.13	16 12.42	8.90	+15 17.74	−0.434	15 38 1.99
17	Mo	15 26 51.66	10.327	18 48 6.0	37.30	16 12.62	8.90	15 6.89	0.470	15 41 58.55
18	Tu	15 30 59.92	10.362	19 2 51.1	36.45	16 12.83	8.90	14 55.18	0.505	15 45 55.11
19	We	15 35 9.03	10.397	19 17 15.7	35.60	16 13.03	8.91	14 42.63	0.540	15 49 51.66
20	Th	15 39 18.98	10.432	19 31 19.6	34.72	16 13.22	8.91	14 29.24	0.575	15 53 48.22
21	Fr	15 43 29.75	10.466	−19 45 2.3	−33.83	16 13.42	8.91	+14 15.02	−0.609	15 57 44.77
22	Sa	15 47 41.34	10.500	19 58 23.4	32.93	16 13.61	8.91	13 59.99	0.643	16 1 41.33
23	Su	15 51 53.73	10.533	20 11 22.6	32.00	16 13.80	8.91	13 44.16	0.676	16 5 37.89
24	Mo	15 56 6.91	10.565	20 23 59.5	31.07	16 13.99	8.91	13 27.54	0.709	16 9 34.44
25	Tu	16 0 20.85	10.597	20 36 13.8	30.12	16 14.18	8.92	13 10.15	0.741	16 13 31.00
26	We	16 4 35.56	10.628	−20 48 5.1	−29.15	16 14.36	8.92	+12 52.00	−0.772	16 17 27.55
27	Th	16 8 51.00	10.658	20 59 33.1	28.18	16 14.54	8.92	12 33.11	0.802	16 21 24.11
28	Fr	16 13 7.16	10.688	21 10 37.5	27.19	16 14.71	8.92	12 13.51	0.831	16 25 20.67
29	Sa	16 17 24.02	10.717	21 21 17.9	26.18	16 14.89	8.92	11 53.21	0.860	16 29 17.22
30	Su	16 21 41.55	10.744	21 31 34.0	25.16	16 15.06	8.92	11 32.23	0.888	16 33 13.78
Dec. 1	Mo	16 25 59.75	10.772	−21 41 25.5	−24.13	16 15.22	8.93	+11 10.58	−0.915	16 37 10.34
2	Tu	16 30 18.59	10.798	21 50 52.1	23.09	16 15.39	8.93	10 48.30	0.941	16 41 6.90
3	We	16 34 38.05	10.823	21 59 53.6	22.04	16 15.55	8.93	10 25.41	0.967	16 45 3.45
4	Th	16 38 58.10	10.848	22 8 29.7	20.97	16 15.70	8.93	10 1.91	0.991	16 49 0.01
5	Fr	16 43 18.73	10.871	22 16 40.1	19.90	16 15.84	8.93	9 37.83	1.015	16 52 56.57
6	Sa	16 47 39.92	10.894	−22 24 24.6	−18.81	16 15.98	8.93	+ 9 13.20	−1.038	16 56 53.12
7	Su	16 52 1.65	10.916	22 31 42.9	17.71	16 16.12	8.93	8 48.03	1.060	17 0 49.68
8	Mo	16 56 23.90	10.938	22 38 34.8	16.61	16 16.25	8.93	8 22.33	1.081	17 4 46.24
9	Tu	17 0 46.65	10.958	22 45 0.1	15.50	16 16.37	8.94	7 56.14	1.101	17 8 42.79
10	We	17 5 9.87	10.977	22 50 58.6	14.37	16 16.48	8.94	7 29.48	1.121	17 12 39.35
11	Th	17 9 33.55	10.995	−22 56 30.0	−13.24	16 16.59	8.94	+ 7 2.36	−1.139	17 16 35.91
12	Fr	17 13 57.64	11.012	23 1 34.3	12.11	16 16.70	8.94	6 34.82	1.156	17 20 32.47
13	Sa	17 18 22.13	11.028	23 6 11.2	10.97	16 16.80	8.94	6 6.89	1.172	17 24 29.02
14	Su	17 22 46.99	11.043	23 10 20.6	9.81	16 16.89	8.94	5 38.59	1.187	17 28 25.58
15	Mo	17 27 12.19	11.056	23 14 2.2	8.66	16 16.98	8.94	5 9.95	1.200	17 32 22.14
16	Tu	17 31 37.68	11.068	−23 17 16.1	− 7.50	16 17.07	8.94	+ 4 41.02	−1.211	17 36 18.70
17	We	17 36 3.44	11.078	23 20 2.1	6.33	16 17.15	8.94	4 11.82	1.222	17 40 15.26
18	Th	17 40 29.43	11.087	23 22 20.0	5.16	16 17.22	8.94	3 42.39	1.231	17 44 11.81
19	Fr	17 44 55.61	11.094	23 24 9.8	3.99	16 17.30	8.95	3 12.76	1.238	17 48 8.37
20	Sa	17 49 21.95	11.100	23 25 31.5	2.82	16 17.37	8.95	2 42.98	1.244	17 52 4.93
21	Su	17 53 48.41	11.104	−23 26 25.0	− 1.64	16 17.43	8.95	+ 2 13.08	−1.248	17 56 1.49
22	Mo	17 58 14.95	11.107	23 26 50.1	− 0.46	16 17.49	8.95	1 43.09	1.251	17 59 58.04
23	Tu	18 2 41.54	11.108	23 26 47.0	+ 0.72	16 17.55	8.95	1 13.06	1.251	18 3 54.60
24	We	18 7 8.13	11.108	23 26 15.6	1.90	16 17.61	8.95	0 43.03	1.251	18 7 51.16
25	Th	18 11 34.70	11.106	23 25 16.0	3.07	16 17.66	8.95	+ 0 13.02	1.249	18 11 47.72
26	Fr	18 16 1.19	11.102	−23 23 48.1	+ 4.25	16 17.70	8.95	− 0 16.92	−1.245	18 15 44.28
27	Sa	18 20 27.58	11.097	23 21 52.0	5.42	16 17.74	8.95	0 46.74	1.240	18 19 40.83
28	Su	18 24 53.82	11.090	23 19 27.8	6.59	16 17.78	8.95	1 16.43	1.234	18 23 37.39
29	Mo	18 29 19.89	11.082	23 16 35.5	7.76	16 17.82	8.95	1 45.94	1.225	18 27 33.95
30	Tu	18 33 45.74	11.072	23 13 15.3	8.92	16 17.85	8.95	2 15.23	1.215	18 31 30.51
31	We	18 38 11.34	11.061	−23 9 27.2	+10.08	16 17.87	8.95	− 2 44.27	−1.204	18 35 27.06
32	Th	18 42 36.66	11.049	−23 5 11.3	+11.24	16 17.89	8.95	− 3 13.03	−1.192	18 39 23.62

FOR GREENWICH MEAN NOON.

Data.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 26′ ″	h m s
Nov.16	320	233 5 15.4	151.22	−0.34	9.995 0941	−38.4	43.91	+12.94	20.70	53.51	8 20 35.77
17	321	234 5 45.7	151.30	0.29	9.995 0026	37.9	44.05	12.95	20.70	53.48	8 16 39.86
18	322	235 6 17.8	151.37	0.21	9.994 9123	37.4	44.18	12.95	20.71	53.46	8 12 43.95
19	323	236 6 51.7	151.44	−0.11	9.994 8230	37.0	44.32	12.96	20.71	53.43	8 8 48.04
20	324	237 7 27.2	151.51	0.00	9.994 7349	36.5	44.46	12.97	20.71	53.40	8 4 52.13
21	325	238 8 4.3	151.58	+0.12	9.994 6478	−36.1	44.60	+12.98	20.72	53.38	8 0 56.22
22	326	239 8 42.9	151.64	0.25	9.994 5618	35.6	44.73	13.00	20.72	53.35	7 57 0.31
23	327	240 9 23.0	151.70	0.38	9.994 4768	35.2	44.87	13.01	20.73	53.32	7 53 4.40
24	328	241 10 4.4	151.75	0.50	9.994 3930	34.7	45.01	13.03	20.73	53.30	7 49 8.49
25	329	242 10 47.1	151.80	0.60	9.994 3104	34.2	45.15	13.05	20.73	53.27	7 45 12.58
26	330	243 11 31.1	151.85	+0.69	9.994 2290	−33.6	45.29	+13.07	20.74	53.25	7 41 16.67
27	331	244 12 16.1	151.90	0.76	9.994 1490	33.0	45.42	13.09	20.74	53.22	7 37 20.76
28	332	245 13 2.3	151.94	0.79	9.994 0704	32.4	45.56	13.11	20.75	53.20	7 33 24.85
29	333	246 13 49.5	151.99	0.80	9.993 9933	31.8	45.70	13.13	20.75	53.18	7 29 28.94
30	334	247 14 37.6	152.02	0.78	9.993 9179	31.0	45.84	13.15	20.75	53.16	7 25 33.03
Dec. 1	335	248 15 26.7	152.06	+0.73	9.993 8443	−30.3	45.97	+13.18	20.76	53.13	7 21 37.12
2	336	249 16 16.6	152.10	0.65	9.993 7726	29.4	46.11	13.21	20.76	53.11	7 17 41.20
3	337	250 17 7.4	152.13	0.55	9.993 7031	28.5	46.25	13.23	20.76	53.09	7 13 45.29
4	338	251 17 59.0	152.17	0.42	9.993 6359	27.5	46.39	13.26	20.77	53.07	7 9 49.38
5	339	252 18 51.5	152.21	0.28	9.993 5711	26.5	46.52	13.29	20.77	53.05	7 5 53.47
6	340	253 19 44.9	152.24	+0.13	9.993 5089	−25.4	46.66	+13.32	20.77	53.03	7 1 57.56
7	341	254 20 39.3	152.28	−0.01	9.993 4494	24.3	46.80	13.35	20.78	53.01	6 58 1.65
8	342	255 21 34.6	152.33	0.14	9.993 3925	23.1	46.94	13.38	20.78	52.99	6 54 5.74
9	343	256 22 30.9	152.37	0.25	9.993 3384	22.0	47.07	13.42	20.78	52.97	6 50 9.83
10	344	257 23 28.4	152.41	0.33	9.993 2869	20.9	47.21	13.45	20.78	52.96	6 46 13.91
11	345	258 24 26.9	152.46	−0.39	9.993 2379	−19.9	47.35	+13.49	20.79	52.94	6 42 18.00
12	346	259 25 26.5	152.51	0.41	9.993 1913	18.9	47.49	13.52	20.79	52.92	6 38 22.09
13	347	260 26 27.3	152.55	0.40	9.993 1471	18.0	47.62	13.56	20.79	52.91	6 34 26.18
14	348	261 27 29.1	152.60	0.36	9.993 1051	17.1	47.76	13.59	20.79	52.89	6 30 30.27
15	349	262 28 31.9	152.64	0.30	9.993 0651	16.2	47.90	13.63	20.79	52.88	6 26 34.36
16	350	263 29 35.7	152.68	−0.21	9.993 0271	−15.4	48.04	+13.67	20.80	52.86	6 22 38.44
17	351	264 30 40.4	152.71	−0.10	9.992 9910	14.7	48.18	13.70	20.80	52.85	6 18 42.53
18	352	265 31 46.0	152.75	+0.02	9.992 9567	13.9	48.31	13.74	20.80	52.84	6 14 46.62
19	353	266 32 52.3	152.78	0.14	9.992 9242	13.2	48.45	13.78	20.80	52.83	6 10 50.71
20	354	267 33 59.4	152.81	0.26	9.992 8935	12.5	48.59	13.82	20.80	52.82	6 6 54.80
21	355	268 35 7.0	152.83	+0.38	9.992 8644	−11.8	48.73	+13.86	20.80	52.81	6 2 58.88
22	356	269 36 15.2	152.85	0.49	9.992 8370	11.1	48.86	13.90	20.80	52.80	5 59 2.97
23	357	270 37 23.8	152.87	0.58	9.992 8112	10.4	49.00	13.94	20.81	52.79	5 55 7.06
24	358	271 38 32.8	152.88	0.66	9.992 7872	9.7	49.14	13.97	20.81	52.79	5 51 11.15
25	359	272 39 42.1	152.89	0.71	9.992 7648	9.0	49.28	14.01	20.81	52.78	5 47 15.24
26	360	273 40 51.5	152.89	+0.73	9.992 7442	− 8.2	49.41	+14.05	20.81	52.77	5 43 19.33
27	361	274 42 1.0	152.90	0.71	9.992 7255	7.4	49.55	14.09	20.81	52.77	5 39 23.41
28	362	275 43 10.6	152.90	0.67	9.992 7087	6.6	49.69	14.13	20.81	52.76	5 35 27.50
29	363	276 44 20.1	152.89	0.60	9.992 6939	5.7	49.83	14.17	20.81	52.76	5 31 31.59
30	364	277 45 29.5	152.89	0.49	9.992 6812	4.8	49.96	14.20	20.81	52.76	5 27 35.68
31	365	278 46 38.7	152.88	+0.37	9.992 6709	− 3.8	50.10	+14.24	20.81	52.75	5 23 39.77
32	366	279 47 47.8	152.87	+0.23	9.992 6630	− 2.9	50.24	+14.28	20.81	52.75	5 19 43.86

5934°—1919——2

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1919.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1919.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1919.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Jan. 1	+0.171 4378	+0.180 0464	−795	−0.888 2902	−0.886 8528	− 66	−0.385 2973	−0.384 6735	−201
2	0.188 6410	0.197 2207	801	0.885 3461	0.883 7702	81	0.384 0196	0.383 3358	206
3	0.205 7850	0.214 3331	806	0.882 1251	0.880 4109	96	0.382 6220	0.381 8782	212
4	0.222 8644	0.231 3780	811	0.878 6279	0.876 7763	111	0.381 1046	0.380 3013	218
5	0.239 8732	0.248 3494	816	0.874 8562	0.872 8677	127	0.379 4683	0.378 6057	224
6	+0.256 8060	+0.265 2422	−820	−0.870 8111	−0.868 6866	−142	−0.377 7136	−0.376 7921	−230
7	0.273 6573	0.282 0506	824	0.866 4944	0.864 2347	158	0.375 8413	0.374 8613	236
8	0.290 4216	0.298 7696	828	0.861 9078	0.859 5138	174	0.373 8521	0.372 8138	242
9	0.307 0939	0.315 3939	831	0.857 0530	0.854 5256	190	0.371 7466	0.370 6505	248
10	0.323 6690	0.331 9185	834	0.851 9319	0.849 2722	206	0.369 5257	0.368 3723	254
11	+0.340 1419	+0.348 3385	−836	−0.846 5466	−0.843 7555	−223	−0.367 1904	−0.365 9801	−260
12	0.356 5077	0.364 6490	838	0.840 8990	0.837 9775	240	0.364 7415	0.363 4747	265
13	0.372 7618	0.380 8455	839	0.834 9912	0.831 9404	257	0.362 1798	0.360 8569	271
14	0.388 8995	0.396 9233	840	0.828 8253	0.825 6462	274	0.359 5061	0.358 1275	277
15	0.404 9162	0.412 8778	841	0.822 4033	0.819 0969	291	0.356 7212	0.355 2873	283
16	+0.420 8074	+0.428 7045	−841	−0.815 7272	−0.812 2944	−308	−0.353 8260	−0.352 3373	−289
17	0.436 5685	0.444 3989	841	0.808 7988	0.805 2407	326	0.350 8213	0.349 2781	295
18	0.452 1950	0.459 9563	841	0.801 6203	0.797 9379	343	0.347 7079	0.346 1107	301
19	0.467 6823	0.475 3723	840	0.794 1937	0.790 3880	361	0.344 4867	0.342 8360	307
20	0.483 0257	0.490 6420	838	0.786 5210	0.782 5930	379	0.341 1587	0.339 4549	313
21	+0.498 2206	+0.505 7609	−836	−0.778 6043	−0.774 5552	−397	−0.337 7248	−0.335 9684	−319
22	0.513 2623	0.520 7243	834	0.770 4459	0.766 2767	415	0.334 1858	0.332 3772	325
23	0.528 1462	0.535 5276	831	0.762 0480	0.757 7601	433	0.330 5428	0.328 6827	331
24	0.542 8677	0.550 1660	828	0.753 4132	0.749 0077	451	0.326 7971	0.324 8860	336
25	0.557 4219	0.564 6347	824	0.744 5439	0.740 0221	469	0.322 9495	0.320 9879	342
26	+0.571 8040	+0.578 9292	−820	−0.735 4427	−0.730 8060	−487	−0.319 0012	−0.316 9897	−348
27	0.586 0097	0.593 0450	815	0.726 1124	0.721 3622	505	0.314 9536	0.312 8929	353
28	0.600 0345	0.606 9775	810	0.716 5559	0.711 6937	523	0.310 8078	0.308 6985	359
29	0.613 8735	0.620 7219	804	0.706 7760	0.701 8033	541	0.306 5651	0.304 4078	364
30	0.627 5222	0.634 2737	798	0.696 7758	0.691 6941	559	0.302 2269	0.300 0225	369
31	+0.640 9760	+0.647 6285	−792	−0.686 5585	−0.681 3695	−576	−0.297 7947	−0.295 5438	−375
Feb. 1	0.654 2307	0.660 7819	785	0.676 1275	0.670 8329	594	0.293 2699	0.290 9733	380
2	0.667 2817	0.673 7295	777	0.665 4863	0.660 0881	612	0.288 6541	0.286 3126	386
3	0.680 1248	0.686 4672	769	0.654 6386	0.649 1385	630	0.283 9490	0.281 5634	392
4	0.692 7561	0.698 9912	761	0.643 5883	0.637 9884	647	0.279 1561	0.276 7273	397
5	+0.705 1719	+0.711 2977	−752	−0.632 3392	−0.626 6413	−665	−0.274 2771	−0.271 8059	−402
6	0.717 3682	0.723 3830	743	0.620 8953	0.615 1016	682	0.269 3138	0.266 8011	407
7	0.729 3416	0.735 2437	733	0.609 2607	0.603 3731	699	0.264 2679	0.261 7145	412
8	0.741 0889	0.746 8768	723	0.597 4394	0.591 4600	716	0.259 1410	0.256 5478	417
9	0.752 6069	0.758 2789	712	0.585 4353	0.579 3659	733	0.253 9349	0.251 3026	422
10	+0.763 8925	+0.769 4473	−701	−0.573 2523	−0.567 0950	−750	−0.248 6512	−0.245 9808	−427
11	0.774 9429	0.780 3790	690	0.560 8945	0.554 6513	767	0.243 2916	0.240 5839	432
12	0.785 7551	0.791 0710	678	0.548 3658	0.542 0385	783	0.237 8578	0.235 1135	436
13	0.796 3262	0.801 5205	666	0.535 6698	0.529 2602	799	0.232 3513	0.229 5713	441
14	0.806 6535	0.811 7249	653	0.522 8103	0.516 3205	815	0.226 7738	0.223 9590	445
15	+0.816 7342	+0.821 6812	−640	−0.509 7913	−0.503 2232	−831	−0.221 1270	−0.218 2781	−449
16	+0.826 5656	+0.831 3869	−627	−0.496 6167	−0.489 9722	−847	−0.215 4125	−0.212 5304	−453

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1919.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1919.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1919.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Feb. 16	+0.826 5656	+0.831 3869	–627	–0.496 6167	–0.489 9722	– 847	–0.215 4125	–0.212 5304	–453
17	0.836 1449	0.840 8392	613	0.483 2901	0.476 5710	862	0.209 6320	0.206 7175	457
18	0.845 4695	0.850 0354	599	0.469 8154	0.463 0238	877	0.203 7871	0.200 8410	461
19	0.854 5365	0.858 9725	584	0.456 1966	0.449 3344	892	0.197 8795	0.194 9028	465
20	0.863 3431	0.867 6479	569	0.442 4377	0.435 5070	907	0.191 9111	0.188 9046	469
21	+0.871 8867	+0.876 0591	–554	–0.428 5428	–0.421 5456	– 921	–0.185 8835	–0.182 8481	–473
22	0.880 1648	0.884 2035	538	0.414 5159	0.407 4542	935	0.179 7987	0.176 7354	476
23	0.888 1749	0.892 0786	522	0.400 3611	0.393 2372	949	0.173 6584	0.170 5680	480
24	0.895 9143	0.899 6817	505	0.386 0829	0.378 8988	963	0.167 4645	0.164 3480	483
25	0.903 3805	0.907 0104	488	0.371 6855	0.364 4434	977	0.161 2189	0.158 0773	486
26	+0.910 5712	+0.914 0625	–471	–0.357 1732	–0.349 8754	– 990	–0.154 9236	–0.151 7579	–489
27	0.917 4841	0.920 8356	454	0.342 5506	0.335 1994	1003	0.148 5806	0.145 3918	492
28	0.924 1168	0.927 3278	436	0.327 8224	0.320 4201	1015	0.142 1918	0.138 9809	495
Mar. 1	0.930 4670	0.933 5356	418	0.312 9932	0.305 5423	1027	0.135 7593	0.132 5273	498
2	0.936 5328	0.939 4586	400	0.298 0679	0.290 5707	1039	0.129 2852	0.126 0333	500
3	+0.942 3127	+0.945 0947	–381	–0.283 0514	–0.275 5106	–1051	–0.122 7719	–0.119 5012	–503
4	0.947 8045	0.950 4419	362	0.267 9489	0.260 3670	1062	0.116 2215	0.112 9330	505
5	0.953 0068	0.955 4992	343	0.252 7654	0.245 1449	1073	0.109 6361	0.106 3309	507
6	0.957 9188	0.960 2656	323	0.237 5060	0.229 8494	1083	0.103 0178	0.099 6970	509
7	0.962 5394	0.964 7401	303	0.222 1757	0.214 4855	1093	0.096 3688	0.093 0335	511
8	+0.966 8676	+0.968 9218	–283	–0.206 7794	–0.199 0580	–1103	–0.089 6913	–0.086 3425	–513
9	0.970 9027	0.972 8102	263	0.191 3220	0.183 5719	1113	0.082 9873	0.079 6260	515
10	0.974 6442	0.976 4047	242	0.175 8084	0.168 0321	1122	0.076 2589	0.072 8861	516
11	0.978 0916	0.979 7048	222	0.160 2434	0.152 4430	1131	0.069 5080	0.066 1248	518
12	0.981 2443	0.982 7101	201	0.144 6315	0.136 8094	1139	0.062 7367	0.059 3440	519
13	+0.984 1021	+0.985 4203	–180	–0.128 9773	–0.121 1357	–1147	–0.055 9470	–0.052 5458	–520
14	0.986 6647	0.987 8351	158	0.113 2853	0.105 4265	1155	0.049 1407	0.045 7320	521
15	0.988 9316	0.989 9541	137	0.097 5600	0.089 6863	1163	0.042 3198	0.038 9045	522
16	0.990 9026	0.991 7771	115	0.081 8059	0.073 9194	1170	0.035 4863	0.032 0654	522
17	0.992 5775	0.993 3037	93	0.066 0274	0.058 1305	1177	0.028 6421	0.025 2166	522
18	+0.993 9558	+0.994 5336	– 71	–0.050 2291	–0.042 3238	–1184	–0.021 7891	–0.018 3599	–522
19	0.995 0372	0.995 4665	49	0.034 4153	0.026 5040	1190	0.014 9293	0.011 4974	522
20	0.995 8216	0.996 1024	27	0.018 5905	–0.010 6754	1196	0.008 0646	–0.004 6311	522
21	0.996 3089	0.996 4411	– 4	–0.002 7593	+0.005 1573	1202	–0.001 1972	+0.002 2370	522
22	0.996 4991	0.996 4828	+ 19	+0.013 0737	0.020 9895	1207	+0.005 6711	0.009 1049	521
23	+0.996 3922	+0.996 2272	+ 42	+0.028 9040	+0.036 8167	–1212	+0.012 5382	+0.015 9707	–521
24	0.995 9879	0.995 6742	65	0.044 7271	0.052 6344	1216	0.019 4021	0.022 8322	520
25	0.995 2862	0.994 8240	88	0.060 5382	0.068 4379	1220	0.026 2608	0.029 6876	519
26	0.994 2876	0.993 6769	111	0.076 3328	0.084 2224	1223	0.033 1124	0.036 5348	518
27	0.992 9921	0.992 2331	134	0.092 1061	0.099 9833	1226	0.039 9545	0.043 3714	517
28	+0.991 4000	+0.990 4928	+158	+0.107 8534	+0.115 7157	–1229	+0.046 7851	+0.050 1954	–515
29	0.989 5116	0.988 4565	181	0.123 5696	0.131 4145	1232	0.053 6021	0.057 0048	514
30	0.987 3276	0.986 1250	205	0.139 2498	0.147 0748	1234	0.060 4033	0.063 7973	512
31	0.984 8487	0.983 4989	229	0.154 8890	0.162 6917	1236	0.067 1865	0.070 5707	510
Apr. 1	0.982 0758	0.980 5796	253	0.170 4822	0.178 2599	1238	0.073 9496	0.077 3230	508
2	+0.979 0101	+0.977 3679	+277	+0.186 0243	+0.193 7747	–1239	+0.080 6905	+0.084 0520	–506
3	+0.975 6531	+0.973 8658	+301	+0.201 5104	+0.209 2309	–1240	+0.087 4071	+0.090 7556	–503

SUN, 1919.

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1919.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1919.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1919.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Apr. 1	+0.982 0758	+0.980 5795	+ 253	+0.170 4822	+0.178 2599	−1238	+0.073 9496	+0.077 3230	−508
2	0.979 0101	0.977 3679	277	0.186 0243	0.193 7747	1239	0.080 6905	0.084 0520	506
3	0.975 6531	0.973 8658	301	0.201 5104	0.209 2309	1240	0.087 4071	0.090 7556	503
4	0.972 0062	0.970 0746	325	0.216 9356	0.224 6239	1240	0.094 0972	0.097 4316	500
5	0.968 0711	0.965 9961	349	0.232 2952	0.239 9490	1240	0.100 7587	0.104 0782	497
6	+0.963 8497	+0.961 6322	+ 373	+0.247 5847	+0.255 2017	−1240	+0.107 3898	+0.110 6934	−494
7	0.959 3439	0.956 9850	398	0.262 7995	0.270 3775	1239	0.113 9886	0.117 2753	491
8	0.954 5557	0.952 0563	422	0.277 9352	0.285 4721	1238	0.120 5532	0.123 8222	488
9	0.949 4871	0.946 8483	447	0.292 9877	0.300 4815	1237	0.127 0819	0.130 3322	484
10	0.944 1402	0.941 3629	472	0.307 9529	0.315 4014	1235	0.133 5728	0.136 8036	480
11	+0.938 5168	+0.935 6020	+ 496	+0.322 8266	+0.330 2279	−1233	+0.140 0241	+0.143 2344	−476
12	0.932 6189	0.929 5678	520	0.337 6048	0.344 9568	1231	0.146 4342	0.149 6233	472
13	0.926 4488	0.923 2623	544	0.352 2835	0.359 5844	1228	0.152 8014	0.155 9683	468
14	0.920 0084	0.916 6874	569	0.366 8589	0.374 1067	1225	0.159 1239	0.162 2679	464
15	0.913 2996	0.909 8452	593	0.381 3272	0.388 5198	1222	0.165 4000	0.168 5201	459
16	+0.906 3246	+0.902 7380	+ 618	+0.395 6842	+0.402 8198	−1218	+0.171 6279	+0.174 7233	−454
17	0.899 0856	0.895 3678	642	0.409 9262	0.417 0029	1214	0.177 8060	0.180 8758	449
18	0.891 5847	0.887 7367	667	0.424 0495	0.431 0654	1209	0.183 9326	0.186 9761	444
19	0.883 8240	0.879 8469	691	0.438 0501	0.445 0032	1204	0.190 0060	0.193 0222	438
20	0.875 8058	0.871 7008	716	0.451 9241	0.458 8124	1199	0.196 0244	0.199 0125	433
21	+0.867 5322	+0.863 3004	+ 740	+0.465 6676	+0.472 4893	−1193	+0.201 9862	+0.204 9453	−427
22	0.859 0056	0.854 6481	765	0.479 2769	0.486 0300	1187	0.207 8897	0.210 8191	421
23	0.850 2283	0.845 7464	789	0.492 7481	0.499 4307	1181	0.213 7332	0.216 6319	415
24	0.841 2028	0.836 5977	813	0.506 0773	0.512 6874	1174	0.219 5150	0.222 3822	409
25	0.831 9315	0.827 2045	837	0.519 2606	0.525 7963	1167	0.225 2332	0.228 0680	402
26	+0.822 4170	+0.817 5694	+ 862	+0.532 2939	+0.538 7530	−1160	+0.230 8862	+0.233 6877	−395
27	0.812 6621	0.807 6954	886	0.545 1731	0.551 5537	1152	0.236 4722	0.239 2396	388
28	0.802 6697	0.797 5854	910	0.557 8943	0.564 1944	1144	0.241 9896	0.244 7220	381
29	0.792 4428	0.787 2424	934	0.570 4536	0.576 6712	1135	0.247 4366	0.250 1332	374
30	0.781 9847	0.776 6701	958	0.582 8469	0.588 9802	1126	0.252 8115	0.255 4714	367
May 1	+0.771 2991	+0.765 8721	+ 982	+0.595 0705	+0.601 1175	−1117	+0.258 1127	+0.260 7352	−359
2	0.760 3895	0.754 8519	1006	0.607 1206	0.613 0794	1107	0.263 3386	0.265 9228	351
3	0.749 2597	0.743 6134	1029	0.618 9936	0.624 8627	1097	0.268 4877	0.271 0330	343
4	0.737 9135	0.732 1604	1053	0.630 6863	0.636 4640	1087	0.273 5586	0.276 0643	335
5	0.726 3547	0.720 4968	1076	0.642 1954	0.647 8802	1076	0.278 5500	0.281 0155	327
6	+0.714 5873	+0.708 6266	+1100	+0.653 5179	+0.659 1082	−1065	+0.283 4606	+0.285 8852	−319
7	0.702 6151	0.696 5534	1123	0.664 6508	0.670 1454	1053	0.288 2891	0.290 6722	310
8	0.690 4418	0.684 2809	1146	0.675 5915	0.680 9889	1041	0.293 0344	0.295 3755	302
9	0.678 0712	0.671 8131	1169	0.686 3373	0.691 6363	1028	0.297 6953	0.299 9937	293
10	0.665 5072	0.659 1539	1192	0.696 8854	0.702 0844	1015	0.302 2706	0.304 5258	284
11	+0.652 7536	+0.646 3069	+1215	+0.707 2331	+0.712 3311	−1002	+0.306 7592	+0.308 9707	−275
12	0.639 8141	0.633 2757	1238	0.717 3780	0.722 3736	989	0.311 1600	0.313 3271	266
13	0.626 6922	0.620 0640	1260	0.727 3176	0.732 2096	975	0.315 4717	0.317 5938	256
14	0.613 3917	0.606 6757	1283	0.737 0494	0.741 8366	961	0.319 6933	0.321 7700	247
15	0.599 9165	0.593 1145	1305	0.746 5709	0.751 2520	946	0.323 8237	0.325 8544	237
16	+0.586 2703	+0.579 3842	+1327	+0.755 8797	+0.760 4537	− 931	+0.327 8620	+0.329 8462	−227
17	+0.572 4568	+0.565 4885	+1349	+0.764 9736	+0.769 4392	− 915	+0.331 8070	+0.333 7442	−217

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1919.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1919.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1919.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
May 17	+0.572 4568	+0.565 4885	+1349	+0.764 9736	+0.769 4392	−915	+0.331 8070	+0.333 7442	−217
18	0.558 4798	0.551 4311	1371	0.773 8502	0.778 2062	899	0.335 6577	0.337 5473	207
19	0.544 3430	0.537 2158	1392	0.782 5069	0.786 7520	883	0.339 4130	0.341 2545	197
20	0.530 0502	0.522 8466	1413	0.790 9414	0.795 0747	866	0.343 0718	0.344 8647	187
21	0.515 6054	0.508 3272	1434	0.799 1515	0.803 1716	849	0.346 6331	0.348 3768	176
22	+0.501 0124	+0.493 6615	+1455	+0.807 1347	+0.811 0405	−831	+0.350 0958	+0.351 7899	−165
23	0.486 2751	0.478 8537	1475	0.814 8887	0.818 6790	813	0.353 4589	0.355 1028	154
24	0.471 3977	0.463 9077	1495	0.822 4112	0.826 0849	795	0.356 7214	0.358 3146	143
25	0.456 3842	0.448 8277	1515	0.829 6997	0.833 2554	776	0.359 8823	0.361 4243	132
26	0.441 2389	0.433 6183	1535	0.836 7518	0.840 1885	757	0.362 9405	0.364 4308	121
27	+0.425 9664	+0.418 2838	+1554	+0.843 5652	+0.846 8817	−737	+0.365 8950	+0.367 3332	−110
28	0.410 5712	0.402 8291	1573	0.850 1378	0.853 3332	717	0.368 7451	0.370 1306	99
29	0.395 0582	0.387 2590	1592	0.856 4675	0.859 5406	696	0.371 4897	0.372 8222	87
30	0.379 4322	0.371 5784	1611	0.862 5523	0.865 5023	675	0.374 1281	0.375 4072	75
31	0.363 6982	0.355 7923	1629	0.868 3905	0.871 2166	654	0.376 6595	0.377 8850	63
June 1	+0.347 8611	+0.339 9054	+1647	+0.873 9805	+0.876 6819	−633	+0.379 0835	+0.380 2549	− 51
2	0.331 9259	0.323 9231	1664	0.879 3208	0.881 8970	611	0.381 3993	0.382 5166	39
3	0.315 8976	0.307 8500	1681	0.884 4105	0.886 8611	589	0.383 6066	0.384 6693	27
4	0.299 7810	0.291 6911	1698	0.889 2485	0.891 5727	566	0.385 7047	0.386 7128	15
5	0.283 5808	0.275 4509	1715	0.893 8337	0.896 0313	543	0.387 6934	0.388 6466	− 3
6	+0.267 3018	+0.259 1342	+1731	+0.898 1655	+0.900 2360	−519	+0.389 5723	+0.390 4705	+ 9
7	0.250 9487	0.242 7458	1747	0.902 2428	0.904 1857	495	0.391 3410	0.392 1839	21
8	0.234 5261	0.226 2902	1762	0.906 0647	0.907 8797	471	0.392 9991	0.393 7866	34
9	0.218 0385	0.209 7717	1777	0.909 6307	0.911 3176	446	0.394 5464	0.395 2784	46
10	0.201 4904	0.193 1951	1791	0.912 9402	0.914 4985	421	0.395 9825	0.396 6587	59
11	+0.184 8863	+0.176 5647	+1805	+0.915 9925	+0.917 4220	−396	+0.397 3069	+0.397 9272	+ 71
12	0.168 2308	0.159 8852	1819	0.918 7870	0.920 0874	370	0.398 5195	0.399 0839	84
13	0.151 5284	0.143 1610	1832	0.921 3231	0.922 4941	344	0.399 6202	0.400 1284	97
14	0.134 7835	0.126 3965	1845	0.923 6002	0.924 6415	317	0.400 6085	0.401 0604	110
15	0.118 0005	0.109 5961	1857	0.925 6178	0.926 5292	290	0.401 4841	0.401 8797	123
16	+0.101 1838	+0.092 7641	+1869	+0.927 3756	+0.928 1569	−263	+0.402 2470	+0.402 5861	+136
17	0.084 3377	0.075 9051	1880	0.928 8730	0.929 5239	236	0.402 8968	0.403 1792	149
18	0.067 4669	0.059 0236	1891	0.930 1095	0.930 6298	208	0.403 4332	0.403 6589	162
19	0.050 5758	0.042 1240	1902	0.931 0847	0.931 4741	180	0.403 8561	0.404 0249	175
20	0.033 6689	0.025 2110	1912	0.931 7980	0.932 0562	151	0.404 1653	0.404 2772	188
21	+0.016 7508	+0.008 2890	+1921	+0.932 2488	+0.932 3756	−122	+0.404 3605	+0.404 4153	+201
22	−0.000 1738	−0.008 6370	1930	0.932 4367	0.932 4320	93	0.404 4415	0.404 4391	214
23	0.017 1000	0.025 5622	1938	0.932 3615	0.932 2251	63	0.404 4082	0.404 3487	227
24	0.034 0229	0.042 4816	1946	0.932 0227	0.931 7543	33	0.404 2605	0.404 1437	240
25	0.050 9375	0.059 3901	1953	0.931 4200	0.931 0197	− 3	0.403 9983	0.403 8243	253
26	−0.067 8387	−0.076 2827	+1960	+0.930 5534	+0.930 0212	+ 28	+0.403 6217	+0.403 3905	+266
27	0.084 7213	0.093 1540	1966	0.929 4232	0.928 7593	58	0.403 1307	0.402 8424	279
28	0.101 5800	0.109 9988	1971	0.928 0295	0.927 2340	89	0.402 5255	0.402 1802	293
29	0.118 4097	0.126 8120	1976	0.926 3728	0.925 4460	120	0.401 8064	0.401 4042	306
30	0.135 2052	0.143 5886	1980	0.924 4537	0.923 3960	151	0.400 9736	0.400 5147	320
July 1	−0.151 9615	−0.160 3233	+1983	+0.922 2730	+0.921 0849	+182	+0.400 0276	+0.399 5122	+333
2	−0.168 6735	−0.177 0115	+1986	+0.919 8317	+0.918 5136	+214	+0.398 9686	+0.398 3969	+348

SUN, 1919.

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1919.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1919.0.	Z True Equinox.		Reduc to Mean Eq'x o 1919.0
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
July 1	−0.151 9615	−0.160 3233	+1983	+0.922 2730	+0.921 0849	+ 182	+0.400 0276	+0.399 5122	+333
2	0.168 6735	0.177 0115	1986	0.919 8317	0.918 5136	214	0.398 9686	0.398 3969	346
3	0.185 3366	0.193 6483	1988	0.917 1308	0.915 6834	246	0.397 7971	0.397 1694	359
4	0.201 9459	0.210 2289	1990	0.914 1716	0.912 5955	278	0.396 5138	0.395 8303	372
5	0.218 4968	0.226 7489	1991	0.910 9551	0.909 2506	310	0.395 1190	0.394 3799	386
6	−0.234 9847	−0.243 2037	+1992	+0.907 4822	+0.905 6501	+ 343	+0.393 6132	+0.392 8188	+399
7	0.251 4052	0.259 5888	1991	0.903 7544	0.901 7954	375	0.391 9969	0.391 1475	412
8	0.267 7538	0.275 8998	1990	0.899 7732	0.897 6878	408	0.390 2707	0.389 3665	425
9	0.284 0261	0.292 1322	1988	0.895 5395	0.893 3283	441	0.388 4350	0.387 4763	438
10	0.300 2176	0.308 2818	1986	0.891 0546	0.888 7185	474	0.386 4904	0.385 4775	451
11	−0.316 3243	−0.324 3445	+1983	+0.886 3201	+0.883 8597	+ 507	+0.384 4376	+0.383 3708	+464
12	0.332 3418	0.340 3158	1980	0.881 3375	0.878 7536	540	0.382 2771	0.381 1566	477
13	0.348 2659	0.356 1916	1976	0.876 1081	0.873 4013	573	0.380 0093	0.378 8354	490
14	0.364 0925	0.371 9680	1971	0.870 6333	0.867 8042	606	0.377 6350	0.376 4080	502
15	0.379 8175	0.387 6406	1965	0.864 9143	0.861 9637	639	0.375 1546	0.373 8748	515
16	−0.395 4367	−0.403 2053	+1959	+0.858 9525	+0.855 8810	+ 673	+0.372 5688	+0.371 2366	+528
17	0.410 9458	0.418 6578	1952	0.852 7494	0.849 5578	706	0.369 8782	0.368 4937	541
18	0.426 3407	0.433 9940	1944	0.846 3064	0.842 9953	740	0.367 0833	0.365 6470	553
19	0.441 6172	0.449 2096	1935	0.839 6248	0.836 1950	774	0.364 1848	0.362 6969	566
20	0.456 7708	0.464 3001	1926	0.832 7060	0.829 1581	807	0.361 1833	0.359 6441	578
21	−0.471 7970	−0.479 2610	+1916	+0.825 5516	+0.821 8866	+ 840	+0.358 0795	+0.356 4895	+590
22	0.486 6915	0.494 0879	1905	0.818 1633	0.814 3820	873	0.354 8742	0.353 2337	602
23	0.501 4497	0.508 7762	1894	0.810 5429	0.806 6462	906	0.351 5682	0.349 8777	614
24	0.516 0669	0.523 3212	1882	0.802 6922	0.798 6811	939	0.348 1623	0.346 4222	626
25	0.530 5386	0.537 7184	1869	0.794 6131	0.790 4886	972	0.344 6574	0.342 8682	638
26	−0.544 8602	−0.551 9633	+1856	+0.786 3079	+0.782 0713	+1005	+0.341 0546	+0.339 2168	+649
27	0.559 0273	0.566 0515	1842	0.777 7791	0.773 4316	1038	0.337 3549	0.335 4691	661
28	0.573 0353	0.579 9783	1827	0.769 0291	0.764 5720	1070	0.333 5594	0.331 6261	672
29	0.586 8800	0.593 7398	1811	0.760 0607	0.755 4954	1103	0.329 6693	0.327 6892	683
30	0.600 5572	0.607 3318	1795	0.750 8766	0.746 2047	1135	0.325 6859	0.323 6596	694
31	−0.614 0630	−0.620 7504	+1778	+0.741 4799	+0.736 7027	+1167	+0.321 6104	+0.319 5385	+705
Aug. 1	0.627 3934	0.633 9917	1760	0.731 8733	0.726 9922	1199	0.317 4440	0.315 3271	716
2	0.640 5447	0.647 0520	1742	0.722 0597	0.717 0762	1231	0.313 1880	0.311 0268	727
3	0.653 5132	0.659 9278	1723	0.712 0422	0.706 9580	1262	0.308 8436	0.306 6387	737
4	0.666 2954	0.672 6156	1703	0.701 8239	0.696 6403	1293	0.304 4121	0.302 1640	748
5	−0.678 8879	−0.685 1119	+1683	+0.691 4076	+0.686 1262	+1324	+0.299 8947	+0.297 6042	+758
6	0.691 2871	0.697 4131	1662	0.680 7964	0.675 4187	1355	0.295 2928	0.292 9606	768
7	0.703 4896	0.709 5161	1640	0.669 9935	0.664 5211	1385	0.290 6077	0.288 2344	778
8	0.715 4922	0.721 4176	1618	0.659 0018	0.653 4361	1415	0.285 8407	0.283 4269	788
9	0.727 2919	0.733 1147	1595	0.647 8243	0.642 1669	1445	0.280 9931	0.278 5395	797
10	−0.738 8856	−0.744 6042	+1571	+0.636 4642	+0.630 7167	+1474	+0.276 0662	+0.273 5734	+807
11	0.750 2701	0.755 8829	1547	0.624 9246	0.619 0883	1503	0.271 0612	0.268 5299	816
12	0.761 4423	0.766 9479	1522	0.613 2083	0.607 2849	1532	0.265 9795	0.263 4103	825
13	0.772 3993	0.777 7961	1496	0.601 3184	0.595 3093	1560	0.260 8223	0.258 2157	834
14	0.783 1380	0.788 4246	1470	0.589 2580	0.583 1648	1588	0.255 5908	0.252 9478	843
15	−0.793 6555	−0.798 8303	+1443	+0.577 0300	+0.570 8541	+1616	+0.250 2867	+0.247 6076	+851
16	−0.803 9485	−0.809 0098	+1415	+0.564 6373	+0.558 3801	+1643	+0.244 9108	+0.242 1965	+859

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1919.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1919.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1919.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Aug. 16	−0.803 9485	−0.809 0098	+1415	+0.564 6373	+0.558 3801	+1643	+0.244 9108	+0.242 1965	+859
17	0.814 0138	0.818 9601	1387	0.552 0829	0.545 7461	1670	0.239 4649	0.236 7160	867
18	0.823 8483	0.828 6780	1358	0.539 3701	0.532 9553	1696	0.233 9501	0.231 1673	875
19	0.833 4488	0.838 1603	1329	0.526 5021	0.520 0109	1722	0.228 3679	0.225 5520	883
20	0.842 8120	0.847 4035	1299	0.513 4822	0.506 9164	1747	0.222 7199	0.219 8717	890
21	−0.851 9345	−0.856 4046	+1269	+0.500 3140	+0.493 6754	+1772	+0.217 0076	+0.214 1279	+897
22	0.860 8133	0.865 1604	1238	0.487 0012	0.480 2917	1797	0.211 2327	0.208 3223	904
23	0.869 4454	0.873 6680	1207	0.473 5475	0.466 7690	1821	0.205 3969	0.202 4567	911
24	0.877 8277	0.881 9243	1175	0.459 9568	0.453 1114	1845	0.199 5018	0.196 5325	918
25	0.885 9573	0.889 9264	1142	0.446 2332	0.439 3229	1868	0.193 5491	0.190 5518	924
26	−0.893 8314	−0.897 6719	+1109	+0.432 3809	+0.425 4078	+1890	+0.187 5408	+0.184 5164	+930
27	0.901 4476	0.905 1582	1076	0.418 4041	0.411 3703	1912	0.181 4787	0.178 4280	936
28	0.908 8035	0.912 3831	1042	0.404 3070	0.397 2148	1933	0.175 3646	0.172 2886	942
29	0.915 8969	0.919 3445	1007	0.390 0941	0.382 9455	1954	0.169 2003	0.166 0999	947
30	0.922 7256	0.926 0401	972	0.375 7695	0.368 5667	1974	0.162 9876	0.159 8637	952
31	−0.929 2877	−0.932 4682	+ 937	+0.361 3376	+0.354 0827	+1994	+0.156 7284	+0.153 5820	+957
Sept. 1	0.935 5814	0.938 6269	901	0.346 8026	0.339 4978	2013	0.150 4246	0.147 2565	962
2	0.941 6046	0.944 5142	865	0.332 1688	0.324 8162	2032	0.144 0779	0.140 8891	966
3	0.947 3557	0.950 1288	828	0.317 4406	0.310 0424	2050	0.137 6902	0.134 4815	970
4	0.952 8334	0.955 4693	791	0.302 6222	0.295 1805	2067	0.131 2633	0.128 0358	974
5	−0.958 0362	−0.960 5340	+ 753	+0.287 7178	+0.280 2347	+2084	+0.124 7991	+0.121 5536	+978
6	0.962 9626	0.965 3217	715	0.272 7317	0.265 2094	2100	0.118 2994	0.115 0367	981
7	0.967 6112	0.969 8310	677	0.257 6682	0.250 1087	2116	0.111 7659	0.108 4871	984
8	0.971 9809	0.974 0608	638	0.242 5313	0.234 9367	2131	0.105 2005	0.101 9064	986
9	0.976 0706	0.978 0101	599	0.227 3253	0.219 6976	2145	0.098 6049	0.095 2963	989
10	−0.979 8791	−0.981 6775	+ 560	+0.212 0540	+0.204 3951	+2159	+0.091 9808	+0.088 6586	+991
11	0.983 4052	0.985 0619	521	0.196 7215	0.189 0336	2172	0.085 3300	0.081 9952	993
12	0.986 6476	0.988 1620	481	0.181 3319	0.173 6169	2185	0.078 6543	0.075 3077	994
13	0.989 6051	0.990 9766	441	0.165 8891	0.158 1490	2197	0.071 9555	0.068 5980	995
14	0.992 2764	0.993 5043	401	0.150 3971	0.142 6340	2208	0.065 2353	0.061 8677	996
15	−0.994 6602	−0.995 7439	+ 360	+0.134 8602	+0.127 0762	+2218	+0.058 4955	+0.055 1189	+997
16	0.996 7553	0.997 6942	319	0.119 2826	0.111 4799	2228	0.051 7381	0.048 3533	998
17	0.998 5604	0.999 3538	278	0.103 6686	0.095 8493	2237	0.044 9649	0.041 5730	998
18	1.000 0743	1.000 7217	236	0.088 0227	0.080 1893	2246	0.038 1780	0.034 7801	998
19	1.001 2959	1.001 7968	194	0.072 3496	0.064 5043	2254	0.031 3795	0.027 9765	998
20	−1.002 2242	−1.002 5782	+ 152	+0.056 6539	+0.048 7991	+2262	+0.024 5713	+0.021 1643	+997
21	1.002 8585	1.003 0651	110	0.040 9405	0.033 0787	2269	0.017 7556	0.014 3456	996
22	1.003 1980	1.003 2571	68	0.025 2142	0.017 3477	2275	0.010 9344	0.007 5224	995
23	1.003 2423	1.003 1537	+ 26	+0.009 4799	+0.001 6113	2280	+0.004 1099	+0.000 6971	993
24	1.002 9911	1.002 7546	− 17	−0.006 2574	−0.014 1257	2285	−0.002 7158	−0.006 1284	991
25	−1.002 4441	−1.002 0597	− 59	−0.021 9929	−0.029 8584	+2289	−0.009 5405	−0.012 9518	+989
26	1.001 6014	1.001 0692	102	0.037 7215	0.045 5817	2292	0.016 3621	0.019 7711	987
27	1.000 4632	0.999 7833	145	0.053 4383	0.061 2908	2295	0.023 1785	0.026 5842	984
28	0.999 0297	0.998 2023	188	0.069 1386	0.076 9810	2297	0.029 9879	0.033 3891	981
29	0.997 3013	0.996 3267	231	0.084 8175	0.092 6474	2298	0.036 7877	0.040 1835	978
30	−0.995 2786	−0.994 1571	− 274	−0.100 4701	−0.108 2851	+2299	−0.043 5763	−0.046 9657	+974
Oct. 1	−0.992 9622	−0.991 6941	− 317	−0.116 0918	−0.123 8896	+2299	−0.050 3515	−0.053 7335	+970

SUN, 1919.

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1919.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1919.0.	Z True Equinox.		Reduc to Mean Eq'x o 1919.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Oct. 1	–0.992 9622	–0.991 6941	– 317	–0.116 0918	–0.123 8896	+2299	–0.050 3515	–0.053 7335	+970
2	0.990 3528	0.988 9384	361	0.131 6779	0.139 4561	2298	0.057 1114	0.060 4849	965
3	0.987 4511	0.985 8910	404	0.147 2237	0.154 9801	2296	0.063 8538	0.067 2179	960
4	0.984 2581	0.982 5527	448	0.162 7246	0.170 4568	2294	0.070 5770	0.073 9307	955
5	0.980 7748	0.978 9246	492	0.178 1760	0.185 8818	2291	0.077 2788	0.080 6211	950
6	–0.977 0023	–0.975 0079	– 535	–0.193 5737	–0.201 2510	+2288	–0.083 9574	–0.087 2874	+944
7	0.972 9416	0.970 8037	579	0.208 9132	0.216 5598	2284	0.090 6109	0.093 9277	938
8	0.968 5942	0.966 3134	622	0.224 1903	0.231 8041	2279	0.097 2376	0.100 5403	932
9	0.963 9613	0.961 5380	665	0.239 4008	0.246 9797	2274	0.103 8355	0.107 1231	926
10	0.959 0437	0.956 4785	708	0.254 5404	0.262 0824	2268	0.110 4028	0.113 6744	919
11	–0.953 8425	–0.951 1359	– 751	–0.269 6052	–0.277 1082	+2261	–0.116 9377	–0.120 1925	+912
12	0.948 3587	0.945 5111	794	0.284 5909	0.292 0528	2254	0.123 4384	0.126 6753	905
13	0.942 5933	0.939 6053	837	0.299 4933	0.306 9118	2246	0.129 9029	0.133 1210	897
14	0.936 5473	0.933 4195	880	0.314 3079	0.321 6810	2237	0.136 3292	0.139 5275	889
15	0.930 2220	0.926 9550	923	0.329 0305	0.336 3559	2227	0.142 7156	0.145 8932	881
16	–0.923 6186	–0.920 2130	– 966	–0.343 6565	–0.350 9318	+2217	–0.149 0600	–0.152 2157	+872
17	0.916 7384	0.913 1950	1009	0.358 1812	0.365 4041	2206	0.155 3602	0.158 4932	863
18	0.909 5829	0.905 9024	1051	0.372 6000	0.379 7682	2195	0.161 6144	0.164 7236	853
19	0.902 1538	0.898 3372	1094	0.386 9082	0.394 0194	2183	0.167 8204	0.170 9047	844
20	0.894 4528	0.890 5010	1136	0.401 1012	0.408 1531	2170	0.173 9762	0.177 0347	834
21	–0.886 4821	–0.882 3963	–1178	–0.415 1744	–0.422 1646	+2157	–0.180 0800	–0.183 1117	+824
22	0.878 2438	0.874 0250	1220	0.429 1230	0.436 0491	2143	0.186 1296	0.189 1334	813
23	0.869 7402	0.865 3897	1262	0.442 9424	0.449 8022	2128	0.192 1230	0.195 0980	802
24	0.860 9738	0.856 4929	1303	0.456 6280	0.463 4193	2113	0.198 0583	0.201 0036	791
25	0.851 9472	0.847 3371	1344	0.470 1755	0.476 8960	2097	0.203 9337	0.206 8483	780
26	–0.842 6630	–0.837 9252	–1385	–0.483 5803	–0.490 2279	+2081	–0.209 7471	–0.212 6300	+768
27	0.833 1242	0.828 2603	1426	0.496 8382	0.503 4107	2064	0.215 4968	0.218 3472	756
28	0.823 3338	0.818 3451	1466	0.509 9450	0.516 4405	2046	0.221 1811	0.223 9981	744
29	0.813 2946	0.808 1827	1507	0.522 8966	0.529 3128	2027	0.226 7980	0.229 5807	732
30	0.803 0098	0.797 7763	1547	0.535 6887	0.542 0238	2008	0.232 3460	0.235 0936	719
31	–0.792 4827	–0.787 1293	–1587	–0.548 3175	–0.554 5695	+1988	–0.237 8233	–0.240 5349	+706
Nov. 1	0.781 7166	0.776 2449	1627	0.560 7792	0.566 9461	1967	0.243 2282	0.245 9030	693
2	0.770 7148	0.765 1266	1666	0.573 0698	0.579 1498	1946	0.248 5590	0.251 1962	679
3	0.759 4808	0.753 7777	1705	0.585 1858	0.591 1773	1924	0.253 8143	0.256 4131	665
4	0.748 0179	0.742 2018	1744	0.597 1238	0.603 0249	1902	0.258 9925	0.261 5522	651
5	–0.736 3298	–0.730 4023	–1782	–0.608 8802	–0.614 6893	+1879	–0.264 0921	–0.266 6119	+637
6	0.724 4198	0.718 3826	1820	0.620 4519	0.626 1675	1855	0.269 1116	0.271 5909	622
7	0.712 2912	0.706 1460	1858	0.631 8356	0.637 4559	1831	0.274 0497	0.276 4878	607
8	0.699 9473	0.693 6956	1895	0.643 0281	0.648 5517	1806	0.278 9050	0.281 3011	592
9	0.687 3914	0.681 0350	1932	0.654 0262	0.659 4513	1781	0.283 6759	0.286 0293	576
10	–0.674 6269	–0.668 1674	–1969	–0.664 8266	–0.670 1515	+1755	–0.288 3610	–0.290 6710	+560
11	0.661 6570	0.655 0961	2005	0.675 4258	0.680 6490	1728	0.292 9589	0.295 2246	545
12	0.648 4850	0.641 8243	2041	0.685 8207	0.690 9404	1700	0.297 4680	0.299 6888	529
13	0.635 1143	0.628 3555	2076	0.696 0077	0.701 0223	1672	0.301 8868	0.304 0619	513
14	0.621 5485	0.614 6937	2111	0.705 9836	0.710 8913	1643	0.306 2138	0.308 3424	496
15	–0.607 7915	–0.600 8425	–2145	–0.715 7448	–0.720 5437	+1614	–0.310 4475	–0.312 5289	+479
16	–0.593 8471	–0.586 8058	–2179	–0.725 2876	–0.729 9762	+1584	–0.314 5864	–0.316 6198	+462

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1919.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1919.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1919.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Nov. 16	−0.593 8471	−0.586 8058	−2179	−0.725 2876	−0.729 9762	+1584	−0.314 5864	−0.316 6198	+462
17	0.579 7192	0.572 5879	2212	0.734 6089	0.739 1854	1553	0.318 6290	0.320 6138	444
18	0.565 4123	0.558 1930	2245	0.743 7053	0.748 1681	1522	0.322 5739	0.324 5093	426
19	0.550 9305	0.543 6255	2278	0.752 5735	0.756 9211	1490	0.326 4197	0.328 3051	409
20	0.536 2784	0.528 8899	2310	0.761 2104	0.765 4411	1458	0.330 1652	0.331 9999	391
21	−0.521 4605	−0 513 9908	−2342	−0.769 6129	−0.773 7254	+1425	−0.333 8090	−0.335 5923	+373
22	0.506 4813	0.498 9327	2373	0.777 7782	0.781 7710	1391	0.337 3497	0.339 0811	355
23	0.491 3457	0.483 7207	2404	0.785 7034	0.789 5750	1357	0.340 7863	0.342 4652	336
24	0.476 0585	0.468 3596	2434	0.793 3856	0.797 1348	1322	0.344 1177	0.345 7436	317
25	0.460 6247	0.452 8544	2463	0.800 8224	0.804 4480	1287	0.347 3427	0.348 9149	298
26	−0.445 0493	−0.437 2100	−2492	−0.808 0114	−0.811 5122	+1251	−0.350 4602	−0.351 9784	+279
27	0.429 3372	0.421 4315	2520	0.814 9502	0.818 3251	1215	0.353 4694	0.354 9330	260
28	0.413 4935	0.405 5239	2547	0.821 6366	0.824 8845	1178	0.356 3692	0.357 7779	241
29	0.397 5232	0.389 4922	2574	0.828 0686	0.831 1885	1140	0.359 1589	0.360 5121	221
30	0.381 4315	0.373 3418	2600	0.834 2441	0.837 2351	1102	0.361 8375	0.363 1348	202
Dec. 1	−0.365 2236	−0.357 0777	−2626	−0.840 1614	−0.843 0227	+1063	−0.364 4041	−0.365 6453	+182
2	0.348 9046	0.340 7050	2651	0.845 8189	0.848 5498	1024	0.366 8583	0.368 0430	162
3	0.332 4795	0.324 2287	2675	0.851 2152	0.853 8149	984	0.369 1993	0.370 3272	142
4	0.315 9533	0.307 6538	2699	0.856 3488	0.858 8167	944	0.371 4265	0.372 4972	122
5	0.299 3309	0.290 9852	2722	0.861 2184	0.863 5538	903	0.373 5392	0.374 5525	101
6	−0.282 6173	−0.274 2277	−2744	−0.865 8228	−0.868 0252	+ 862	−0.375 5369	−0.376 4924	+ 81
7	0.265 8171	0.257 3860	2766	0.870 1608	0.872 2294	820	0.377 4190	0.378 3166	60
8	0.248 9351	0.240 4649	2787	0.874 2310	0.876 1653	777	0.379 1850	0.380 0242	39
9	0.231 9760	0.223 4690	2807	0.878 0322	0.879 8315	734	0.380 8342	0.381 6148	+ 18
10	0.214 9445	0.206 4031	2827	0.881 5629	0.883 2264	690	0.382 3660	0.383 0876	− 3
11	−0.197 8454	−0.189 2721	−2845	−0.884 8217	−0.886 3488	+ 646	−0.383 7797	−0.384 4421	− 24
12	0.180 6839	0.172 0813	2862	0.887 8075	0.889 1976	602	0.385 0748	0.385 6776	45
13	0.163 4649	0.154 8354	2879	0.890 5189	0.891 7712	557	0.386 2506	0.386 7937	66
14	0.146 1935	0.137 5398	2895	0.892 9544	0.894 0683	512	0.387 3067	0.387 7897	87
15	0.128 8751	0.120 2000	2910	0.895 1129	0.896 0880	466	0.388 2425	0.388 6652	108
16	−0.111 5152	−0.102 8214	−2924	−0.896 9935	−0.897 8292	+ 420	−0.389 0577	−0.389 4199	−129
17	0.094 1192	0.085 4094	2938	0.898 5950	0.899 2909	373	0.389 7517	0.390 0532	151
18	0.076 6928	0.067 9699	2950	0.899 9167	0.900 4723	326	0.390 3243	0.390 5650	172
19	0.059 2414	0.050 5081	2962	0.900 9578	0.901 3730	279	0.390 7752	0.390 9549	194
20	0.041 7707	0.033 0299	2973	0.901 7180	0.901 9926	231	0.391 1042	0.391 2230	215
21	−0.024 2865	−0.015 5411	−2984	−0.902 1967	−0.902 3304	+ 183	−0.391 3112	−0.391 3689	−237
22	−0.006 7945	+0.001 9527	2993	0.902 3936	0.902 3863	135	0.391 3960	0.391 3925	258
23	+0.010 6997	0.019 4458	3001	0.902 3085	0.902 1602	86	0.391 3585	0.391 2939	280
24	0.028 1902	0.036 9323	3008	0.901 9414	0.901 6521	+ 37	0.391 1988	0.391 0731	301
25	0.045 6713	0.054 4065	3015	0.901 2924	0.900 8623	− 13	0.390 9170	0.390 7304	323
26	+0.063 1373	+0.071 8629	−3020	−0.900 3618	−0.899 7910	− 63	−0.390 5133	−0.390 2658	−344
27	0.080 5825	0.089 2955	3024	0.899 1500	0.898 4389	113	0.389 9878	0.389 6795	366
28	0.098 0012	0.106 6989	3027	0.897 6577	0.896 8065	163	0.389 3408	0.388 9718	387
29	0.115 3878	0.124 0673	3030	0.895 8855	0.894 8947	213	0.388 5725	0.388 1430	409
30	0.132 7368	0.141 3956	3031	0.893 8344	0.892 7046	263	0.387 6834	0.387 1936	430
31	+0.150 0429	+0.158 6782	−3031	−0.891 5055	−0.890 2371	− 314	−0.386 6738	−0.386 1240	−452
32	+0.167 3007	+0.175 9099	−3031	−0.888 8996	−0.887 4932	− 365	−0.385 5442	−0.384 9346	−473

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 1.					JANUARY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 59 55.83	2.2857	−21 54 52.0	+2.779	0	19 49 5.87	2.2449	−17 27 14.9	+ 8.205
1	18 2 12.98	2.2861	21 52 1.6	2.899	1	19 51 20.51	2.2431	17 18 59.6	8.305
2	18 4 30.16	2.2864	21 49 4.1	3.019	2	19 53 35.04	2.2413	17 10 38.3	8.404
3	18 6 47.35	2.2867	21 45 59.3	3.141	3	19 55 49.47	2.2395	17 2 11.1	8.502
4	18 9 4.56	2.2869	21 42 47.2	3.261	4	19 58 3.78	2.2376	16 53 38.1	8.598
5	18 11 21.78	2.2871	21 39 28.0	3.380	5	20 0 17.98	2.2358	16 44 59.3	8.695
6	18 13 39.01	2.2872	21 36 1.6	3.500	6	20 2 32.07	2.2339	16 36 14.7	8.791
7	18 15 56.24	2.2872	21 32 28.0	3.620	7	20 4 46.05	2.2320	16 27 24.4	8.886
8	18 18 13.47	2.2872	21 28 47.2	3.740	8	20 6 59.91	2.2301	16 18 28.4	8.980
9	18 20 30.70	2.2871	21 24 59.2	3.859	9	20 9 13.66	2.2282	16 9 26.8	9.073
10	18 22 47.92	2.2870	21 21 4.1	3.978	10	20 11 27.29	2.2263	16 0 19.7	9.165
11	18 25 5.14	2.2868	21 17 1.8	4.098	11	20 13 40.81	2.2243	15 51 7.0	9.257
12	18 27 22.33	2.2864	21 12 52.4	4.216	12	20 15 54.21	2.2224	15 41 48.9	9.347
13	18 29 39.51	2.2861	21 8 35.9	4.335	13	20 18 7.50	2.2205	15 32 25.4	9.437
14	18 31 56.66	2.2857	21 4 12.2	4.453	14	20 20 20.67	2.2185	15 22 56.5	9.526
15	18 34 13.79	2.2853	20 59 41.5	4.571	15	20 22 33.72	2.2165	15 13 22.3	9.613
16	18 36 30.90	2.2848	20 55 3.7	4.688	16	20 24 46.65	2.2146	15 3 42.9	9.700
17	18 38 47.97	2.2842	20 50 18.9	4.806	17	20 26 59.47	2.2128	14 53 58.3	9.786
18	18 41 5.00	2.2836	20 45 27.0	4.923	18	20 29 12.18	2.2108	14 44 8.6	9.871
19	18 43 22.00	2.2830	20 40 28.1	5.039	19	20 31 24.76	2.2088	14 34 13.8	9.956
20	18 45 38.96	2.2823	20 35 22.3	5.156	20	20 33 37.23	2.2068	14 24 13.9	10.039
21	18 47 55.87	2.2814	20 30 9.4	5.272	21	20 35 49.58	2.2049	14 14 9.1	10.121
22	18 50 12.73	2.2807	20 24 49.7	5.387	22	20 38 1.82	2.2030	14 3 59.4	10.203
23	18 52 29.55	2.2798	−20 19 23.0	+5.503	23	20 40 13.94	2.2010	−13 53 44.8	+10.283
	JANUARY 2.					JANUARY 4.			
0	18 54 46.31	2.2789	−20 13 49.4	+5.618	0	20 42 25.94	2.1991	−13 43 25.4	+10.363
1	18 57 3.02	2.2779	20 8 8.9	5.732	1	20 44 37.83	2.1972	13 33 1.3	10.441
2	18 59 19.66	2.2768	20 2 21.6	5.845	2	20 46 49.60	2.1953	13 22 32.5	10.518
3	19 1 36.24	2.2758	19 56 27.5	5.958	3	20 49 1.27	2.1935	13 11 59.1	10.594
4	19 3 52.76	2.2748	19 50 26.6	6.072	4	20 51 12.82	2.1916	13 1 21.2	10.670
5	19 6 9.22	2.2737	19 44 18.9	6.184	5	20 53 24.26	2.1897	12 50 38.7	10.745
6	19 8 25.60	2.2723	19 38 4.5	6.296	6	20 55 35.58	2.1878	12 39 51.8	10.818
7	19 10 41.90	2.2712	19 31 43.4	6.408	7	20 57 46.80	2.1861	12 29 0.5	10.891
8	19 12 58.14	2.2699	19 25 15.6	6.518	8	20 59 57.91	2.1843	12 18 4.9	10.963
9	19 15 14.29	2.2686	19 18 41.3	6.628	9	21 2 8.91	2.1824	12 7 5.0	11.033
10	19 17 30.37	2.2673	19 12 0.3	6.738	10	21 4 19.80	2.1807	11 56 0.9	11.103
11	19 19 46.36	2.2658	19 5 12.8	6.847	11	21 6 30.59	2.1790	11 44 52.7	11.171
12	19 22 2.27	2.2644	18 58 18.7	6.956	12	21 8 41.28	2.1773	11 33 40.4	11.238
13	19 24 18.09	2.2630	18 51 18.1	7.063	13	21 10 51.86	2.1755	11 22 24.1	11.304
14	19 26 33.83	2.2615	18 44 11.1	7.170	14	21 13 2.34	2.1738	11 11 3.9	11.370
15	19 28 49.47	2.2599	18 36 57.7	7.277	15	21 15 12.72	2.1722	10 59 39.7	11.434
16	19 31 5.02	2.2583	18 29 37.9	7.383	16	21 17 23.00	2.1706	10 48 11.8	11.497
17	19 33 20.47	2.2568	18 22 11.8	7.488	17	21 19 33.19	2.1690	10 36 40.1	11.560
18	19 35 35.83	2.2552	18 14 39.3	7.593	18	21 21 43.28	2.1674	10 25 4.6	11.621
19	19 37 51.09	2.2535	18 7 0.7	7.696	19	21 23 53.28	2.1659	10 13 25.6	11.680
20	19 40 6.25	2.2518	17 59 15.8	7.800	20	21 26 3.19	2.1644	10 1 43.0	11.740
21	19 42 21.31	2.2502	17 51 24.7	7.903	21	21 28 13.01	2.1629	9 49 56.8	11.798
22	19 44 36.27	2.2484	17 43 27.5	8.004	22	21 30 22.74	2.1614	9 38 7.2	11.854
23	19 46 51.12	2.2467	17 35 24.2	8.105	23	21 32 32.38	2.1600	9 26 14.3	11.910
24	19 49 5.87	2.2449	−17 27 14.9	+8.205	24	21 34 41.94	2.1587	− 9 14 18.0	+11.965

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 5.					JANUARY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 34 41.94	2.1587	−9 14 18.0	+11.965	0	23 17 32.80	2.1461	+ 1 1 40.7	+13.259
1	21 36 51.42	2.1573	9 2 18.5	12.018	1	23 19 41.60	2.1472	1 14 56.2	13.258
2	21 39 0.82	2.1560	8 50 15.8	12.071	2	23 21 50.46	2.1482	1 28 11.6	13.256
3	21 41 10.14	2.1548	8 38 10.0	12.123	3	23 23 59.38	2.1494	1 41 26.9	13.252
4	21 43 19.39	2.1535	8 26 1.1	12.173	4	23 26 8.39	2.1507	1 54 41.8	13.246
5	21 45 28.56	2.1523	8 13 49.3	12.222	5	23 28 17.46	2.1519	2 7 56.4	13.239
6	21 47 37.66	2.1512	8 1 34.5	12.270	6	23 30 26.62	2.1533	2 21 10.5	13.232
7	21 49 46.70	2.1500	7 49 16.9	12.317	7	23 32 35.86	2.1548	2 34 24.2	13.223
8	21 51 55.66	2.1489	7 36 56.5	12.363	8	23 34 45.19	2.1563	2 47 37.3	13.213
9	21 54 4.57	2.1479	7 24 33.4	12.408	9	23 36 54.61	2.1578	3 0 49.8	13.202
10	21 56 13.41	2.1469	7 12 7.6	12.451	10	23 39 4.12	2.1593	3 14 1.5	13.189
11	21 58 22.20	2.1460	6 59 39.3	12.493	11	23 41 13.73	2.1610	3 27 12.5	13.176
12	22 0 30.93	2.1451	6 47 8.4	12.535	12	23 43 23.44	2.1628	3 40 22.6	13.161
13	22 2 39.61	2.1442	6 34 35.1	12.575	13	23 45 33.26	2.1645	3 53 31.8	13.144
14	22 4 48.23	2.1433	6 21 59.4	12.614	14	23 47 43.18	2.1663	4 6 39.9	13.127
15	22 6 56.81	2.1426	6 9 21.4	12.652	15	23 49 53.21	2.1682	4 19 47.0	13.108
16	22 9 5.34	2.1418	5 56 41.2	12.688	16	23 52 3.36	2.1702	4 32 52.9	13.088
17	22 11 13.83	2.1413	5 43 58.8	12.725	17	23 54 13.63	2.1722	4 45 57.6	13.068
18	22 13 22.29	2.1406	5 31 14.2	12.760	18	23 56 24.02	2.1742	4 59 1.0	13.045
19	22 15 30.70	2.1399	5 18 27.6	12.793	19	23 58 34.53	2.1763	5 12 3.0	13.022
20	22 17 39.08	2.1394	5 5 39.1	12.824	20	0 0 45.18	2.1785	5 25 3.6	12.997
21	22 19 47.43	2.1389	4 52 48.7	12.856	21	0 2 55.95	2.1807	5 38 2.6	12.970
22	22 21 55.75	2.1385	4 39 56.4	12.887	22	0 5 6.86	2.1830	5 51 0.0	12.943
23	22 24 4.05	2.1382	−4 27 2.3	+12.916	23	0 7 17.91	2.1853	+ 6 3 55.8	+12.915
	JANUARY 6.					JANUARY 8.			
0	22 26 12.33	2.1378	−4 14 6.5	+12.943	0	0 9 29.10	2.1878	+ 6 16 49.8	+12.885
1	22 28 20.59	2.1375	4 1 9.1	12.969	1	0 11 40.44	2.1902	6 29 42.0	12.853
2	22 30 28.83	2.1373	3 48 10.2	12.995	2	0 13 51.92	2.1927	6 42 32.2	12.821
3	22 32 37.06	2.1371	3 35 9.7	13.019	3	0 16 3.56	2.1953	6 55 20.5	12.788
4	22 34 45.28	2.1369	3 22 7.9	13.042	4	0 18 15.35	2.1979	7 8 6.8	12.753
5	22 36 53.49	2.1368	3 9 4.7	13.064	5	0 20 27.31	2.2006	7 20 50.9	12.717
6	22 39 1.70	2.1368	2 56 0.2	13.086	6	0 22 39.42	2.2033	7 33 32.8	12.679
7	22 41 9.91	2.1369	2 42 54.4	13.105	7	0 24 51.70	2.2061	7 46 12.4	12.641
8	22 43 18.13	2.1370	2 29 47.6	13.123	8	0 27 4.15	2.2089	7 58 49.7	12.601
9	22 45 26.35	2.1371	2 16 39.6	13.141	9	0 29 16.77	2.2118	8 11 24.5	12.559
10	22 47 34.58	2.1373	2 3 30.7	13.157	10	0 31 29.57	2.2148	8 23 56.8	12.517
11	22 49 42.83	2.1376	1 50 20.8	13.173	11	0 33 42.54	2.2178	8 36 26.5	12.473
12	22 51 51.09	2.1378	1 37 10.0	13.186	12	0 35 55.70	2.2208	8 48 53.6	12.428
13	22 53 59.37	2.1383	1 23 58.5	13.198	13	0 38 9.04	2.2238	9 1 17.9	12.382
14	22 56 7.68	2.1387	1 10 46.2	13.210	14	0 40 22.56	2.2270	9 13 39.4	12.334
15	22 58 16.01	2.1392	0 57 33.3	13.220	15	0 42 36.28	2.2303	9 25 58.0	12.285
16	23 0 24.38	2.1398	0 44 19.8	13.229	16	0 44 50.19	2.2334	9 38 13.6	12.235
17	23 2 32.78	2.1403	0 31 5.8	13.238	17	0 47 4.29	2.2367	9 50 26.2	12.184
18	23 4 41.21	2.1409	0 17 51.3	13.244	18	0 49 18.59	2.2400	10 2 35.7	12.131
19	23 6 49.69	2.1417	−0 4 36.5	13.249	19	0 51 33.09	2.2434	10 14 41.9	12.077
20	23 8 58.21	2.1423	+0 8 38.6	13.254	20	0 53 47.80	2.2468	10 26 44.9	12.022
21	23 11 6.77	2.1432	0 21 54.0	13.258	21	0 56 2.71	2.2503	10 38 44.5	11.964
22	23 13 15.39	2.1442	0 35 9.5	13.259	22	0 58 17.83	2.2538	10 50 40.6	11.907
23	23 15 24.07	2.1451	0 48 25.1	13.260	23	1 0 33.16	2.2573	11 2 33.3	11.848
24	23 17 32.80	2.1461	+1 1 40.7	+13.259	24	1 2 48.71	2.2609	+11 14 22.3	+11.787

GREENWICH MEAN TIME.

JANUARY 9.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
0	1	2	48.71	2.2609	+11	14	22.3	+11.787
1	1	5	4.47	2.2645	11	26	7.7	11.725
2	1	7	20.45	2.2682	11	37	49.3	11.662
3	1	9	36.65	2.2718	11	49	27.1	11.598
4	1	11	53.07	2.2756	12	1	1.0	11.532
5	1	14	9.72	2.2793	12	12	30.9	11.464
6	1	16	26.59	2.2831	12	23	56.7	11.395
7	1	18	43.69	2.2869	12	35	18.3	11.326
8	1	21	1.02	2.2908	12	46	35.8	11.255
9	1	23	18.59	2.2947	12	57	48.9	11.183
10	1	25	36.38	2.2986	13	8	57.7	11.109
11	1	27	54.42	2.3026	13	20	2.0	11.034
12	1	30	12.69	2.3065	13	31	1.8	10.958
13	1	32	31.20	2.3106	13	41	57.0	10.880
14	1	34	49.96	2.3146	13	52	47.4	10.801
15	1	37	8.95	2.3186	14	3	33.1	10.721
16	1	39	28.19	2.3227	14	14	13.9	10.639
17	1	41	47.67	2.3268	14	24	49.8	10.556
18	1	44	7.40	2.3309	14	35	20.6	10.472
19	1	46	27.38	2.3350	14	45	46.4	10.388
20	1	48	47.60	2.3391	14	56	7.1	10.301
21	1	51	8.07	2.3433	15	6	22.5	10.212
22	1	53	28.79	2.3474	15	16	32.5	10.123
23	1	55	49.76	2.3516	+15	26	37.2	+10.033

JANUARY 10.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
0	1	58	10.98	2.3558	+15	36	36.4	+ 9.941
1	2	0	32.45	2.3599	15	46	30.1	9.848
2	2	2	54.17	2.3642	15	56	18.1	9.753
3	2	5	16.15	2.3683	16	6	0.4	9.658
4	2	7	38.37	2.3724	16	15	37.0	9.560
5	2	10	0.84	2.3767	16	25	7.6	9.462
6	2	12	23.57	2.3808	16	34	32.4	9.363
7	2	14	46.54	2.3850	16	43	51.1	9.262
8	2	17	9.77	2.3893	16	53	3.8	9.160
9	2	19	33.25	2.3933	17	2	10.3	9.057
10	2	21	56.97	2.3974	17	11	10.6	8.953
11	2	24	20.94	2.4016	17	20	4.6	8.847
12	2	26	45.16	2.4058	17	28	52.2	8.740
13	2	29	9.63	2.4098	17	37	33.4	8.632
14	2	31	34.34	2.4139	17	46	8.0	8.523
15	2	33	59.30	2.4180	17	54	36.1	8.413
16	2	36	24.50	2.4220	18	2	57.5	8.300
17	2	38	49.94	2.4261	18	11	12.1	8.188
18	2	41	15.63	2.4301	18	19	20.0	8.074
19	2	43	41.55	2.4340	18	27	21.0	7.958
20	2	46	7.71	2.4379	18	35	15.0	7.842
21	2	48	34.10	2.4418	18	43	2.0	7.725
22	2	51	0.73	2.4457	18	50	42.0	7.607
23	2	53	27.58	2.4495	18	58	14.8	7.487
24	2	55	54.67	2.4533	+19	5	40.4	+ 7.366

JANUARY 11.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
0	2	55	54.67	2.4533	+19	5	40.4	+7.366
1	2	58	21.98	2.4570	19	12	58.7	7.244
2	3	0	49.51	2.4608	19	20	9.7	7.122
3	3	3	17.27	2.4644	19	27	13.3	6.998
4	3	5	45.24	2.4680	19	34	9.4	6.873
5	3	8	13.43	2.4716	19	40	58.0	6.746
6	3	10	41.83	2.4751	19	47	38.9	6.619
7	3	13	10.44	2.4785	19	54	12.3	6.492
8	3	15	39.25	2.4818	20	0	37.9	6.363
9	3	18	8.26	2.4852	20	6	55.8	6.233
10	3	20	37.47	2.4885	20	13	5.9	6.103
11	3	23	6.88	2.4918	20	19	8.1	5.970
12	3	25	36.48	2.4949	20	25	2.3	5.838
13	3	28	6.27	2.4979	20	30	48.6	5.704
14	3	30	36.23	2.5009	20	36	26.8	5.569
15	3	33	6.38	2.5040	20	41	56.9	5.434
16	3	35	36.71	2.5068	20	47	18.9	5.298
17	3	38	7.20	2.5095	20	52	32.7	5.161
18	3	40	37.85	2.5123	20	57	38.2	5.023
19	3	43	8.67	2.5150	21	2	35.5	4.885
20	3	45	39.65	2.5175	21	7	24.4	4.746
21	3	48	10.77	2.5199	21	12	5.0	4.606
22	3	50	42.04	2.5223	21	16	37.1	4.465
23	3	53	13.45	2.5247	+21	21	0.8	+4.324

JANUARY 12.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
0	3	55	45.00	2.5269	+21	25	16.0	+4.182
1	3	58	16.68	2.5290	21	29	22.6	4.039
2	4	0	48.48	2.5310	21	33	20.7	3.897
3	4	3	20.40	2.5329	21	37	10.2	3.753
4	4	5	52.43	2.5348	21	40	51.0	3.608
5	4	8	24.58	2.5366	21	44	23.1	3.463
6	4	10	56.82	2.5383	21	47	46.5	3.318
7	4	13	29.17	2.5398	21	51	1.2	3.172
8	4	16	1.60	2.5412	21	54	7.1	3.026
9	4	18	34.11	2.5426	21	57	4.3	2.879
10	4	21	6.71	2.5439	21	59	52.6	2.732
11	4	23	39.38	2.5450	22	2	32.1	2.584
12	4	26	12.11	2.5461	22	5	2.7	2.436
13	4	28	44.91	2.5470	22	7	24.4	2.288
14	4	31	17.75	2.5478	22	9	37.3	2.140
15	4	33	50.65	2.5486	22	11	41.2	1.991
16	4	36	23.58	2.5492	22	13	36.2	1.843
17	4	38	56.55	2.5498	22	15	22.3	1.693
18	4	41	29.55	2.5502	22	16	59.4	1.543
19	4	44	2.57	2.5504	22	18	27.5	1.394
20	4	46	35.60	2.5506	22	19	46.7	1.244
21	4	49	8.64	2.5507	22	20	56.8	1.094
22	4	51	41.68	2.5507	22	21	58.0	0.945
23	4	54	14.72	2.5505	22	22	50.2	0.795
24	4	56	47.74	2.5502	+22	23	33.4	+0.645

GREENWICH MEAN TIME.

JANUARY 13.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	4 56 47.74	2.5502	+22 23 33.4	+0.645
1	4 59 20.74	2.5498	22 24 7.6	0.495
2	5 1 53.72	2.5494	22 24 32.8	0.346
3	5 4 26.67	2.5488	22 24 49.1	0.196
4	5 6 59.57	2.5480	22 24 56.3	+0.046
5	5 9 32.43	2.5473	22 24 54.6	−0.103
6	5 12 5.24	2.5463	22 24 44.0	0.253
7	5 14 37.99	2.5453	22 24 24.3	0.402
8	5 17 10.67	2.5441	22 23 55.8	0.550
9	5 19 43.28	2.5428	22 23 18.3	0.699
10	5 22 15.81	2.5414	22 22 31.9	0.848
11	5 24 48.25	2.5399	22 21 36.6	0.996
12	5 27 20.60	2.5383	22 20 32.4	1.143
13	5 29 52.85	2.5366	22 19 19.4	1.291
14	5 32 24.99	2.5348	22 17 57.5	1.438
15	5 34 57.02	2.5328	22 16 26.8	1.585
16	5 37 28.93	2.5308	22 14 47.3	1.731
17	5 40 0.71	2.5287	22 12 59.1	1.876
18	5 42 32.37	2.5264	22 11 2.2	2.021
19	5 45 3.88	2.5240	22 8 56.6	2.166
20	5 47 35.25	2.5215	22 6 42.3	2.310
21	5 50 6.46	2.5189	22 4 19.4	2.453
22	5 52 37.52	2.5163	22 1 47.9	2.597
23	5 55 8.42	2.5136	+21 59 7.8	−2.739

JANUARY 14.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	5 57 39.15	2.5107	+21 56 19.2	−2.881
1	6 0 9.70	2.5077	21 53 22.1	3.021
2	6 2 40.07	2.5046	21 50 16.7	3.161
3	6 5 10.25	2.5015	21 47 2.8	3.302
4	6 7 40.25	2.4983	21 43 40.5	3.440
5	6 10 10.04	2.4948	21 40 10.0	3.578
6	6 12 39.63	2.4914	21 36 31.2	3.715
7	6 15 9.01	2.4879	21 32 44.2	3.851
8	6 17 38.18	2.4843	21 28 49.1	3.986
9	6 20 7.12	2.4806	21 24 45.9	4.122
10	6 22 35.85	2.4768	21 20 34.5	4.256
11	6 25 4.34	2.4729	21 16 15.2	4.388
12	6 27 32.60	2.4690	21 11 48.0	4.519
13	6 30 0.62	2.4649	21 7 12.9	4.651
14	6 32 28.39	2.4608	21 2 29.9	4.781
15	6 34 55.92	2.4567	20 57 39.2	4.910
16	6 37 23.19	2.4524	20 52 40.7	5.038
17	6 39 50.21	2.4482	20 47 34.6	5.165
18	6 42 16.97	2.4437	20 42 20.9	5.291
19	6 44 43.45	2.4393	20 36 59.7	5.416
20	6 47 9.68	2.4348	20 31 31.0	5.540
21	6 49 35.62	2.4302	20 25 54.9	5.663
22	6 52 1.30	2.4256	20 20 11.4	5.785
23	6 54 26.69	2.4208	20 14 20.7	5.906
24	6 56 51.79	2.4160	+20 8 22.7	−6.026

JANUARY 15.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	6 56 51.79	2.4160	+20 8 22.7	− 6.026
1	6 59 16.61	2.4113	20 2 17.6	6.143
2	7 1 41.14	2.4063	19 56 5.5	6.261
3	7 4 5.37	2.4014	19 49 46.3	6.377
4	7 6 29.31	2.3965	19 43 20.3	6.492
5	7 8 52.95	2.3915	19 36 47.3	6.606
6	7 11 16.29	2.3864	19 30 7.6	6.718
7	7 13 39.32	2.3813	19 23 21.2	6.829
8	7 16 2.04	2.3761	19 16 28.1	6.940
9	7 18 24.45	2.3710	19 9 28.4	7.048
10	7 20 46.56	2.3658	19 2 22.3	7.156
11	7 23 8.35	2.3605	18 55 9.7	7.263
12	7 25 29.82	2.3553	18 47 50.7	7.368
13	7 27 50.98	2.3499	18 40 25.5	7.472
14	7 30 11.81	2.3445	18 32 54.1	7.574
15	7 32 32.32	2.3392	18 25 16.6	7.676
16	7 34 52.51	2.3338	18 17 33.0	7.776
17	7 37 12.38	2.3284	18 9 43.5	7.875
18	7 39 31.92	2.3229	18 1 48.0	7.973
19	7 41 51.13	2.3174	17 53 46.8	8.068
20	7 44 10.01	2.3120	17 45 39.8	8.164
21	7 46 28.57	2.3065	17 37 27.1	8.258
22	7 48 46.79	2.3010	17 29 8.9	8.349
23	7 51 4.69	2.2955	+17 20 45.2	− 8.441

JANUARY 16.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	7 53 22.25	2.2899	+17 12 16.0	− 8.531
1	7 55 39.48	2.2844	17 3 41.5	8.619
2	7 57 56.38	2.2789	16 55 1.7	8.707
3	8 0 12.95	2.2733	16 46 16.7	8.793
4	8 2 29.18	2.2678	16 37 26.6	8.877
5	8 4 45.08	2.2623	16 28 31.5	8.959
6	8 7 0.65	2.2568	16 19 31.5	9.042
7	8 9 15.89	2.2513	16 10 26.5	9.123
8	8 11 30.80	2.2457	16 1 16.8	9.202
9	8 13 45.37	2.2402	15 52 2.3	9.280
10	8 15 59.62	2.2347	15 42 43.2	9.357
11	8 18 13.53	2.2291	15 33 19.5	9.433
12	8 20 27.11	2.2236	15 23 51.3	9.507
13	8 22 40.36	2.2182	15 14 18.7	9.579
14	8 24 53.29	2.2127	15 4 41.8	9.650
15	8 27 5.88	2.2072	14 55 0.7	9.721
16	8 29 18.15	2.2018	14 45 15.3	9.790
17	8 31 30.10	2.1963	14 35 25.9	9.858
18	8 33 41.71	2.1909	14 25 32.4	9.924
19	8 35 53.01	2.1856	14 15 35.0	9.988
20	8 38 3.98	2.1803	14 5 33.8	10.053
21	8 40 14.64	2.1749	13 55 28.7	10.116
22	8 42 24.97	2.1695	13 45 19.9	10.177
23	8 44 34.98	2.1643	13 35 7.5	10.237
24	8 46 44.68	2.1590	+13 24 51.5	−10.2[illegible]

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 17.					JANUARY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 46 44.68	2.1590	+13 24 51.5	−10.296	0	10 25 3.41	1.9555	+4 25 0.9	−11.787
1	8 48 54.06	2.1538	13 14 32.0	10.353	1	10 27 0.65	1.9525	4 13 13.5	11.793
2	8 51 3.14	2.1487	13 4 9.1	10.409	2	10 28 57.71	1.9496	4 1 25.7	11.799
3	8 53 11.90	2.1434	12 53 42.9	10.465	3	10 30 54.60	1.9468	3 49 37.6	11.804
4	8 55 20.35	2.1383	12 43 13.3	10.519	4	10 32 51.32	1.9439	3 37 49.2	11.808
5	8 57 28.49	2.1332	12 32 40.6	10.571	5	10 34 47.87	1.9411	3 26 0.6	11.811
6	8 59 36.33	2.1282	12 22 4.8	10.623	6	10 36 44.25	1.9384	3 14 11.9	11.813
7	9 1 43.87	2.1231	12 11 25.9	10.673	7	10 38 40.48	1.9358	3 2 23.0	11.815
8	9 3 51.10	2.1180	12 0 44.0	10.723	8	10 40 36.55	1.9332	2 50 34.1	11.816
9	9 5 58.03	2.1131	11 49 59.2	10.770	9	10 42 32.46	1.9307	2 38 45.1	11.816
10	9 8 4.67	2.1082	11 39 11.6	10.817	10	10 44 28.23	1.9283	2 26 56.2	11.814
11	9 10 11.01	2.1033	11 28 21.2	10.863	11	10 46 23.85	1.9258	2 15 7.4	11.813
12	9 12 17.06	2.0984	11 17 28.1	10.907	12	10 48 19.32	1.9234	2 3 18.7	11.810
13	9 14 22.82	2.0937	11 6 32.4	10.949	13	10 50 14.66	1.9212	1 51 30.2	11.807
14	9 16 28.30	2.0888	10 55 34.2	10.992	14	10 52 9.86	1.9189	1 39 41.9	11.803
15	9 18 33.48	2.0841	10 44 33.4	11.033	15	10 54 4.93	1.9167	1 27 53.9	11.798
16	9 20 38.39	2.0794	10 33 30.3	11.072	16	10 55 59.86	1.9146	1 16 6.2	11.793
17	9 22 43.01	2.0748	10 22 24.8	11.111	17	10 57 54.68	1.9126	1 4 18.8	11.786
18	9 24 47.36	2.0703	10 11 17.0	11.148	18	10 59 49.37	1.9105	0 52 31.9	11.778
19	9 26 51.44	2.0657	10 0 7.0	11.184	19	11 1 43.94	1.9086	0 40 45.4	11.770
20	9 28 55.24	2.0611	9 48 54.9	11.219	20	11 3 38.40	1.9067	0 28 59.5	11.761
21	9 30 58.77	2.0567	9 37 40.7	11.253	21	11 5 32.74	1.9048	0 17 14.1	11.753
22	9 33 2.04	2.0523	9 26 24.5	11.287	22	11 7 26.98	1.9031	+0 5 29.2	11.743
23	9 35 5.05	2.0479	+ 9 15 6.3	−11.318	23	11 9 21.11	1.9013	−0 6 15.0	−11.731
	JANUARY 18.					JANUARY 20.			
0	9 37 7.79	2.0436	+ 9 3 46.3	−11.349	0	11 11 15.14	1.8997	−0 17 58.5	−11.719
1	9 39 10.28	2.0393	8 52 24.4	11.379	1	11 13 9.07	1.8981	0 29 41.3	11.708
2	9 41 12.51	2.0351	8 41 0.8	11.408	2	11 15 2.91	1.8967	0 41 23.4	11.695
3	9 43 14.49	2.0309	8 29 35.5	11.435	3	11 16 56.67	1.8952	0 53 4.7	11.681
4	9 45 16.22	2.0268	8 18 8.6	11.462	4	11 18 50.33	1.8937	1 4 45.1	11.666
5	9 47 17.71	2.0228	8 6 40.1	11.488	5	11 20 43.91	1.8923	1 16 24.6	11.651
6	9 49 18.95	2.0188	7 55 10.1	11.513	6	11 22 37.41	1.8910	1 28 3.2	11.636
7	9 51 19.96	2.0148	7 43 38.6	11.536	7	11 24 30.83	1.8898	1 39 40.9	11.619
8	9 53 20.73	2.0108	7 32 5.8	11.558	8	11 26 24.18	1.8885	1 51 17.5	11.602
9	9 55 21.26	2.0069	7 20 31.7	11.579	9	11 28 17.45	1.8874	2 2 53.1	11.584
10	9 57 21.56	2.0032	7 8 56.3	11.601	10	11 30 10.67	1.8864	2 14 27.6	11.566
11	9 59 21.64	1.9994	6 57 19.6	11.620	11	11 32 3.82	1.8853	2 26 1.0	11.547
12	10 1 21.49	1.9957	6 45 41.9	11.638	12	11 33 56.91	1.8844	2 37 33.2	11.527
13	10 3 21.12	1.9920	6 34 3.1	11.656	13	11 35 49.95	1.8835	2 49 4.2	11.507
14	10 5 20.53	1.9884	6 22 23.2	11.673	14	11 37 42.93	1.8826	3 0 34.0	11.485
15	10 7 19.73	1.9848	6 10 42.4	11.688	15	11 39 35.86	1.8818	3 12 2.4	11.463
16	10 9 18.71	1.9813	5 59 0.7	11.702	16	11 41 28.75	1.8811	3 23 29.6	11.442
17	10 11 17.49	1.9780	5 47 18.2	11.716	17	11 43 21.59	1.8804	3 34 55.4	11.41
18	10 13 16.07	1.9746	5 35 34.8	11.729	18	11 45 14.40	1.8798	3 46 19.8	11.39
19	10 15 14.44	1.9712	5 23 50.7	11.741	19	11 47 7.17	1.8793	3 57 42.7	11.37
20	10 17 12.61	1.9680	5 12 5.9	11.753	20	11 48 59.91	1.8788	4 9 4.2	11.34
21	10 19 10.60	1.9648	5 0 20.4	11.763	21	11 50 52.62	1.8783	4 20 24.2	11.32
22	10 21 8.39	1.9616	4 48 34.4	11.771	22	11 52 45.30	1.8779	4 31 42.6	11.29
23	10 23 5.99	1.9585	4 36 47.9	11.779	23	11 54 37.97	1.8776	4 42 59.4	11.26
24	10 25 3.41	1.9555	+ 4 25 0.9	−11.787	24	11 56 30.61	1.8773	−4 54 14.6	−11.23

MOON, 1919.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 21.					**JANUARY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 56 30.61	1.8773	− 4 54 14.6	−11.239	0	13 27 18.24	1.9250	−13 11 4.3	−9.242
1	11 58 23.24	1.8770	5 5 28.1	11.212	1	13 29 13.80	1.9272	13 20 17.1	9.186
2	12 0 15.85	1.8768	5 16 40.0	11.183	2	13 31 9.50	1.9294	13 29 26.6	9.130
3	12 2 8.46	1.8768	5 27 50.1	11.154	3	13 33 5.33	1.9316	13 38 32.7	9.073
4	12 4 1.06	1.8767	5 38 58.5	11.124	4	13 35 1.29	1.9338	13 47 35.3	9.016
5	12 5 53.66	1.8768	5 50 5.0	11.093	5	13 36 57.39	1.9363	13 56 34.6	8.958
6	12 7 46.27	1.8768	6 1 9.7	11.063	6	13 38 53.64	1.9386	14 5 30.3	8.899
7	12 9 38.87	1.8768	6 12 12.5	11.031	7	13 40 50.02	1.9409	14 14 22.5	8.840
8	12 11 31.49	1.8770	6 23 13.4	10.999	8	13 42 46.55	1.9433	14 23 11.1	8.781
9	12 13 24.11	1.8772	6 34 12.4	10.967	9	13 44 43.22	1.9458	14 31 56.2	8.721
10	12 15 16.75	1.8775	6 45 9.4	10.933	10	13 46 40.05	1.9483	14 40 37.6	8.660
11	12 17 9.41	1.8778	6 56 4.3	10.898	11	13 48 37.02	1.9508	14 49 15.4	8.598
12	12 19 2.09	1.8782	7 6 57.2	10.864	12	13 50 34.15	1.9535	14 57 49.4	8.536
13	12 20 54.79	1.8786	7 17 48.0	10.829	13	13 52 31.44	1.9561	15 6 19.7	8.473
14	12 22 47.52	1.8791	7 28 36.7	10.793	14	13 54 28.88	1.9587	15 14 46.2	8.410
15	12 24 40.28	1.8796	7 39 23.2	10.757	15	13 56 26.48	1.9613	15 23 8.9	8.347
16	12 26 33.07	1.8802	7 50 7.5	10.720	16	13 58 24.24	1.9641	15 31 27.8	8.283
17	12 28 25.90	1.8808	8 0 49.6	10.683	17	14 0 22.17	1.9668	15 39 42.8	8.218
18	12 30 18.77	1.8815	8 11 29.5	10.645	18	14 2 20.26	1.9696	15 47 53.9	8.152
19	12 32 11.68	1.8823	8 22 7.0	10.607	19	14 4 18.52	1.9724	15 56 1.0	8.085
20	12 34 4.64	1.8831	8 32 42.3	10.568	20	14 6 16.95	1.9753	16 4 4.1	8.019
21	12 35 57.65	1.8839	8 43 15.1	10.528	21	14 8 15.56	1.9782	16 12 3.3	7.952
22	12 37 50.71	1.8848	8 53 45.6	10.488	22	14 10 14.33	1.9810	16 19 58.3	7.883
23	12 39 43.83	1.8858	− 9 4 13.6	−10.447	23	14 12 13.28	1.9840	−16 27 49.3	−7.815
	JANUARY 22.					**JANUARY 24.**			
0	12 41 37.00	1.8867	− 9 14 39.2	−10.406	0	14 14 12.41	1.9870	−16 35 36.1	−7.745
1	12 43 30.23	1.8878	9 25 2.3	10.363	1	14 16 11.72	1.9899	16 43 18.7	7.676
2	12 45 23.53	1.8889	9 35 22.8	10.321	2	14 18 11.20	1.9929	16 50 57.2	7.606
3	12 47 16.90	1.8901	9 45 40.8	10.278	3	14 20 10.87	1.9960	16 58 31.4	7.534
4	12 49 10.34	1.8913	9 55 56.1	10.233	4	14 22 10.72	1.9991	17 6 1.3	7.463
5	12 51 3.85	1.8924	10 6 8.8	10.190	5	14 24 10.76	2.0022	17 13 26.9	7.390
6	12 52 57.43	1.8938	10 16 18.9	10.145	6	14 26 10.98	2.0053	17 20 48.1	7.318
7	12 54 51.10	1.8951	10 26 26.2	10.099	7	14 28 11.39	2.0084	17 28 5.0	7.244
8	12 56 44.84	1.8965	10 36 30.8	10.054	8	14 30 11.99	2.0116	17 35 17.4	7.170
9	12 58 38.68	1.8980	10 46 32.7	10.008	9	14 32 12.78	2.0148	17 42 25.4	7.095
10	13 0 32.60	1.8994	10 56 31.7	9.960	10	14 34 13.76	2.0180	17 49 28.8	7.020
11	13 2 26.61	1.9009	11 6 27.9	9.913	11	14 36 14.94	2.0213	17 56 27.8	6.944
12	13 4 20.71	1.9025	11 16 21.2	9.864	12	14 38 16.31	2.0245	18 3 22.1	6.867
13	13 6 14.91	1.9042	11 26 11.6	9.815	13	14 40 17.88	2.0278	18 10 11.8	6.790
14	13 8 9.21	1.9058	11 35 59.0	9.766	14	14 42 19.64	2.0310	18 16 56.9	6.713
15	13 10 3.61	1.9075	11 45 43.5	9.717	15	14 44 21.60	2.0343	18 23 37.3	6.634
16	13 11 58.11	1.9093	11 55 25.0	9.666	16	14 46 23.76	2.0376	18 30 13.0	6.555
17	13 13 52.73	1.9112	12 5 3.4	9.615	17	14 48 26.11	2.0409	18 36 43.9	6.475
18	13 15 47.45	1.9129	12 14 38.8	9.563	18	14 50 28.67	2.0443	18 43 10.0	6.395
19	13 17 42.28	1.9148	12 24 11.0	9.511	19	14 52 31.43	2.0477	18 49 31.3	6.314
20	13 19 37.23	1.9168	12 33 40.1	9.458	20	14 54 34.39	2.0511	18 55 47.7	6.232
21	13 21 32.30	1.9188	12 43 6.0	9.405	21	14 56 37.56	2.0545	19 1 59.1	6.149
22	13 23 27.49	1.9208	12 52 28.7	9.351	22	14 58 40.93	2.0578	19 8 5.6	6.068
23	13 25 22.80	1.9229	13 1 48.1	9.297	23	15 0 44.50	2.0612	19 14 7.2	5.984
24	13 27 18.24	1.9250	*−13 11 4.3*	*−9.242*	24	15 2 48.27	2.0646	−19 20 3.7	−5.9

MOON, 1919.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 25.					JANUARY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 2 48.27	2.0646	−19 20 3.7	−5.900	0	16 45 46.94	2.2201	−22 14 46.6	−1.159
1	15 4 52.25	2.0681	19 25 55.2	5.815	1	16 48 0.23	2.2228	22 15 52.8	1.047
2	15 6 56.44	2.0715	19 31 41.5	5.729	2	16 50 13.67	2.2253	22 16 52.2	0.934
3	15 9 0.83	2.0749	19 37 22.7	5.644	3	16 52 27.27	2.2279	22 17 44.9	0.822
4	15 11 5.43	2.0783	19 42 58.8	5.558	4	16 54 41.02	2.2304	22 18 30.8	0.708
5	15 13 10.23	2.0818	19 48 29.6	5.470	5	16 56 54.92	2.2329	22 19 9.8	0.594
6	15 15 15.25	2.0853	19 53 55.2	5.383	6	16 59 8.97	2.2353	22 19 42.1	0.481
7	15 17 20.47	2.0888	19 59 15.5	5.294	7	17 1 23.16	2.2378	22 20 7.5	0.366
8	15 19 25.90	2.0922	20 4 30.5	5.205	8	17 3 37.50	2.2402	22 20 26.0	0.251
9	15 21 31.53	2.0956	20 9 40.1	5.115	9	17 5 51.98	2.2424	22 20 37.6	0.136
10	15 23 37.37	2.0991	20 14 44.3	5.024	10	17 8 6.59	2.2447	22 20 42.3	−0.021
11	15 25 43.42	2.1026	20 19 43.0	4.933	11	17 10 21.34	2.2469	22 20 40.1	+0.095
12	15 27 49.68	2.1060	20 24 36.3	4.843	12	17 12 36.22	2.2491	22 20 30.9	0.212
13	15 29 56.14	2.1094	20 29 24.1	4.750	13	17 14 51.23	2.2513	22 20 14.7	0.328
14	15 32 2.81	2.1129	20 34 6.3	4.657	14	17 17 6.37	2.2533	22 19 51.6	0.444
15	15 34 9.69	2.1163	20 38 42.9	4.564	15	17 19 21.63	2.2553	22 19 21.4	0.562
16	15 36 16.77	2.1198	20 43 14.0	4.470	16	17 21 37.00	2.2573	22 18 44.2	0.679
17	15 38 24.06	2.1232	20 47 39.3	4.375	17	17 23 52.50	2.2593	22 17 59.9	0.798
18	15 40 31.55	2.1266	20 51 59.0	4.280	18	17 26 8.11	2.2611	22 17 8.5	0.915
19	15 42 39.25	2.1300	20 56 12.9	4.183	19	17 28 23.83	2.2628	22 16 10.1	1.033
20	15 44 47.15	2.1334	21 0 21.0	4.088	20	17 30 39.65	2.2647	22 15 4.6	1.152
21	15 46 55.26	2.1368	21 4 23.4	3.991	21	17 32 55.59	2.2664	22 13 51.9	1.270
22	15 49 3.57	2.1402	21 8 19.9	3.893	22	17 35 11.62	2.2680	22 12 32.2	1.388
23	15 51 12.08	2.1435	−21 12 10.5	−3.794	23	17 37 27.75	2.2697	−22 11 5.3	+1.508
	JANUARY 26.					JANUARY 28.			
0	15 53 20.79	2.1468	−21 15 55.2	−3.696	0	17 39 43.98	2.2713	−22 9 31.2	+1.628
1	15 55 29.70	2.1502	21 19 34.0	3.597	1	17 42 0.30	2.2728	22 7 50.0	1.747
2	15 57 38.81	2.1535	21 23 6.8	3.496	2	17 44 16.71	2.2742	22 6 1.6	1.867
3	15 59 48.12	2.1568	21 26 33.5	3.395	3	17 46 33.20	2.2756	22 4 6.0	1.987
4	16 1 57.63	2.1602	21 29 54.2	3.295	4	17 48 49.78	2.2770	22 2 3.2	2.106
5	16 4 7.34	2.1633	21 33 8.9	3.193	5	17 51 6.44	2.2783	21 59 53.3	2.226
6	16 6 17.23	2.1666	21 36 17.3	3.090	6	17 53 23.17	2.2795	21 57 36.1	2.347
7	16 8 27.33	2.1698	21 39 19.7	2.988	7	17 55 39.98	2.2807	21 55 11.7	2.467
8	16 10 37.61	2.1730	21 42 15.8	2.884	8	17 57 56.85	2.2818	21 52 40.1	2.587
9	16 12 48.09	2.1762	21 45 5.8	2.781	9	18 0 13.79	2.2828	21 50 1.3	2.707
10	16 14 58.75	2.1793	21 47 49.5	2.675	10	18 2 30.79	2.2838	21 47 15.3	2.827
11	16 17 9.60	2.1824	21 50 26.8	2.570	11	18 4 47.85	2.2848	21 44 22.1	2.948
12	16 19 20.64	2.1855	21 52 57.9	2.465	12	18 7 4.97	2.2858	21 41 21.6	3.068
13	16 21 31.86	2.1886	21 55 22.6	2.359	13	18 9 22.14	2.2867	21 38 13.9	3.189
14	16 23 43.27	2.1917	21 57 41.0	2.253	14	18 11 39.37	2.2875	21 34 58.9	3.309
15	16 25 54.86	2.1946	21 59 52.9	2.145	15	18 13 56.64	2.2882	21 31 36.8	3.429
16	16 28 6.62	2.1975	22 1 58.4	2.038	16	18 16 13.95	2.2888	21 28 7.4	3.550
17	16 30 18.56	2.2005	22 3 57.4	1.929	17	18 18 31.30	2.2895	21 24 30.8	3.670
18	16 32 30.68	2.2034	22 5 49.9	1.820	18	18 20 48.69	2.2902	21 20 47.0	3.791
19	16 34 42.97	2.2063	22 7 35.8	1.711	19	18 23 6.12	2.2907	21 16 55.9	3.911
20	16 36 55.43	2.2091	22 9 15.2	1.602	20	18 25 23.57	2.2911	21 12 57.7	4.030
21	16 39 8.06	2.2119	22 10 48.0	1.492	21	18 27 41.05	2.2916	21 8 52.3	4.151
22	16 41 20.86	2.2147	22 12 14.2	1.381	22	18 29 58.56	2.2920	21 4 39.6	4.271
23	16 43 33.82	2.2173	22 13 33.7	1.270	23	18 32 16.09	2.2923	21 0 19.8	4.390
24	16 45 46.94	2.2201	−22 14 46.6	−1.159	24	18 34 33.63	2.2925	−20 55 52.8	+4.510

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 29.					JANUARY 31.			
h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
18 34 33.63	2.2925	−20 55 52.8	+4.510	0	20 24 4.39	2.2575	−15 8 41.2	+ 9.743
18 36 51.19	2.2928	20 51 18.6	4.629	1	20 26 19.80	2.2562	14 58 53.9	9.834
18 39 8.76	2.2929	20 46 37.3	4.748	2	20 28 35.13,	2.2548	14 49 1.1	9.926
18 41 26.34	2.2930	20 41 48.8	4.868	3	20 30 50.38	2.2535	14 39 2.8	10.017
18 43 43.92	2.2931	20 36 53.2	4.986	4	20 33 5.55	2.2521	14 28 59.1	10.106
18 46 1.51	2.2932	20 31 50.5	5.104	5	20 35 20.63	2.2507	14 18 50.1	10.195
18 48 19.10	2.2931	20 26 40.7	5.223	6	20 37 35.63	2.2493	14 8 35.7	10.283
18 50 36.68	2.2930	20 21 23.8	5.341	7	20 39 50.55	2.2479	13 58 16.2	10.368
18 52 54.26	2.2928	20 15 59.8	5.458	8	20 42 5.38	2.2465	13 47 51.5	10.455
18 55 11.82	2.2927	20 10 28.8	5.575	9	20 44 20.13	2.2451	13 37 21.6	10.540
18 57 29.38	2.2925	20 4 50.8	5.693	10	20 46 34.79	2.2438	13 26 46.7	10.623
18 59 46.92	2.2922	19 59 5.7	5.809	11	20 48 49.38	2.2424	13 16 6.8	10.706
19 2 4.44	2.2918	19 53 13.7	5.925	12	20 51 3.88	2.2410	13 5 22.0	10.788
19 4 21.94	2.2915	19 47 14.7	6.041	13	20 53 18.30	2.2397	12 54 32.3	10.868
19 6 39.42	2.2911	19 41 8.8	6.157	14	20 55 32.64	2.2383	12 43 37.8	10.948
19 8 56.87	2.2907	19 34 55.9	6.272	15	20 57 46.89	2.2368	12 32 38.6	11.026
19 11 14.30	2.2902	19 28 36.2	6.386	16	21 0 1.06	2.2356	12 21 34.7	11.104
19 13 31.69	2.2896	19 22 9.6	6.501	17	21 2 15.16	2.2343	12 10 26.1	11.181
19 15 49.05	2.2891	19 15 36.1	6.615	18	21 4 29.17	2.2328	11 59 13.0	11.255
19 18 6.38	2.2884	19 8 55.8	6.728	19	21 6 43.10	2.2315	11 47 55.5	11.329
19 20 23.66	2.2878	19 2 8.8	6.840	20	21 8 56.95	2.2302	11 36 33.5	11.403
19 22 40.91	2.2871	18 55 15.0	6.953	21	21 11 10.72	2.2289	11 25 7.1	11.476
19 24 58.11	2.2863	18 48 14.4	7.065	22	21 13 24.42	2.2277	11 13 36.4	11.547
19 27 15.27	2.2856	−18 41 7.2	+7.176	23	21 15 38.04	2.2263	−11 2 1.5	+11.616
JANUARY 30.					FEBRUARY 1.			
19 29 32.38	2.2848	−18 33 53.3	+7.287	0	21 17 51.58	2.2251	−10 50 22.5	+11.684
19 31 49.44	2.2839	18 26 32.8	7.397	1	21 20 5.05	2.2238	10 38 39.4	11.752
19 34 6.45	2.2831	18 19 5.7	7.507	2	21 22 18.44	2.2227	10 26 52.3	11.818
19 36 23.41	2.2822	18 11 32.0	7.616	3	21 24 31.77	2.2215	10 15 1.2	11.883
19 38 40.31	2.2813	18 3 51.8	7.723	4	21 26 45.02	2.2203	10 3 6.3	11.948
19 40 57.16	2.2803	17 56 5.2	7.832	5	21 28 58.20	2.2191	9 51 7.5	12.011
19 43 13.94	2.2793	17 48 12.0	7.939	6	21 31 11.31	2.2179	9 39 5.0	12.072
19 45 30.67	2.2783	17 40 12.5	8.045	7	21 33 24.35	2.2168	9 26 58.9	12.132
19 47 47.33	2.2772	17 32 6.6	8.152	8	21 35 37.33	2.2158	9 14 49.2	12.192
19 50 3.93	2.2762	17 23 54.3	8.257	9	21 37 50.24	2.2147	9 2 35.9	12.250
19 52 20.47	2.2751	17 15 35.8	8.361	10	21 40 3.09	2.2136	8 50 19.2	12.306
19 54 36.94	2.2739	17 7 11.0	8.465	11	21 42 15.87	2.2126	8 37 59.2	12.362
19 56 53.34	2.2728	16 58 40.0	8.568	12	21 44 28.60	2.2117	8 25 35.8	12.417
19 59 9.67	2.2716	16 50 2.9	8.670	13	21 46 41.27	2.2107	8 13 9.2	12.469
20 1 25.93	2.2704	16 41 19.6	8.772	14	21 48 53.88	2.2097	8 0 39.5	12.521
20 3 42.12	2.2693	16 32 30.3	8.873	15	21 51 6.43	2.2088	7 48 6.7	12.572
20 5 58.24	2.2680	16 23 34.9	8.973	16	21 53 18.93	2.2079	7 35 30.9	12.621
20 8 14.28	2.2668	16 14 33.6	9.071	17	21 55 31.38	2.2070	7 22 52.2	12.669
20 10 30.25	2.2655	16 5 26.4	9.170	18	21 57 43.77	2.2062	7 10 10.6	12.716
20 12 46.14	2.2642	15 56 13.2	9.268	19	21 59 56.12	2.2054	6 57 26.3	12.762
20 15 1.95	2.2628	15 46 54.3	9.364	20	22 2 8.42	2.2047	6 44 39.2	12.806
20 17 17.68	2.2615	15 37 29.5	9.460	21	22 4 20.68	2.2040	6 31 49.6	12.848
20 19 33.33	2.2602	15 27 59.1	9.554	22	22 6 32.90	2.2033	6 18 57.4	12.891
20 21 48.90	2.2588	15 18 23.0	9.649	23	22 8 45.07	2.2026	6 6 2.7	12.932
20 24 4.39	2.2575	−15 8 41.2	+9.743	24	22 10 57.21	2.2020	− 5 53 5.6	+12.971

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 2.					FEBRUARY 4.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 10 57.21	2.2020	−5 53 5.6	+12.971	0	23 56 43.74	2.2228	+ 4 49 8.3	+13.26
1	22 13 9.31	2.2014	5 40 6.2	13.008	1	23 58 57.16	2.2243	5 2 23.4	13.23
2	22 15 21.38	2.2009	5 27 4.7	13.044	2	0 1 10.66	2.2259	5 15 36.9	13.20
3	22 17 33.42	2.2003	5 14 0.9	13.080	3	0 3 24.27	2.2277	5 28 48.5	13.17
4	22 19 45.42	2.1998	5 0 55.1	13.113	4	0 5 37.98	2.2293	5 41 58.3	13.14
5	22 21 57.40	2.1995	4 47 47.3	13.147	5	0 7 51.79	2.2311	5 55 6.2	13.11
6	22 24 9.36	2.1991	4 34 37.5	13.178	6	0 10 5.71	2.2329	6 8 12.0	13.08
7	22 26 21.29	2.1987	4 21 26.0	13.207	7	0 12 19.74	2.2348	6 21 15.8	13.04
8	22 28 33.20	2.1984	4 8 12.7	13.237	8	0 14 33.89	2.2367	6 34 17.4	13.00
9	22 30 45.10	2.1982	3 54 57.6	13.264	9	0 16 48.14	2.2386	6 47 16.7	12.96
10	22 32 56.98	2.1979	3 41 41.0	13.289	10	0 19 2.52	2.2406	7 0 13.6	12.92
11	22 35 8.85	2.1978	3 28 22.9	13.314	11	0 21 17.01	2.2426	7 13 8.2	12.88
12	22 37 20.71	2.1976	3 15 3.3	13.338	12	0 23 31.63	2.2447	7 26 0.2	12.84
13	22 39 32.56	2.1975	3 1 42.4	13.359	13	0 25 46.37	2.2468	7 38 49.6	12.80
14	22 41 44.41	2.1974	2 48 20.2	13.380	14	0 28 1.24	2.2488	7 51 36.4	12.75
15	22 43 56.25	2.1973	2 34 56.8	13.399	15	0 30 16.23	2.2511	8 4 20.4	12.70
16	22 46 8.09	2.1974	2 21 32.3	13.417	16	0 32 31.37	2.2533	8 17 1.5	12.66
17	22 48 19.94	2.1975	2 8 6.8	13.433	17	0 34 46.63	2.2555	8 29 39.8	12.61
18	22 50 31.79	2.1976	1 54 40.4	13.448	18	0 37 2.03	2.2579	8 42 15.0	12.56
19	22 52 43.65	2.1978	1 41 13.0	13.463	19	0 39 17.58	2.2603	8 54 47.2	12.51
20	22 54 55.52	2.1980	1 27 44.9	13.475	20	0 41 33.26	2.2626	9 7 16.2	12.45
21	22 57 7.41	2.1983	1 14 16.0	13.486	21	0 43 49.09	2.2650	9 19 41.9	12.40
22	22 59 19.31	2.1985	1 0 46.6	13.495	22	0 46 5.06	2.2675	9 32 4.4	12.34
23	23 1 31.23	2.1988	−0 47 16.6	+13.504	23	0 48 21.19	2.2700	+ 9 44 23.4	+12.28
	FEBRUARY 3.					FEBRUARY 5.			
0	23 3 43.17	2.1993	−0 33 46.1	+13.511	0	0 50 37.46	2.2725	+ 9 56 39.0	+12.23
1	23 5 55.14	2.1997	0 20 15.3	13.517	1	0 52 53.89	2.2751	10 8 51.0	12.16
2	23 8 7.13	2.2002	−0 6 44.1	13.521	2	0 55 10.47	2.2776	10 20 59.3	12.10
3	23 10 19.16	2.2008	+0 6 47.2	13.523	3	0 57 27.20	2.2803	10 33 4.0	12.04
4	23 12 31.22	2.2013	0 20 18.7	13.526	4	0 59 44.10	2.2829	10 45 4.9	11.98
5	23 14 43.31	2.2018	0 33 50.3	13.525	5	1 2 1.15	2.2856	10 57 1.9	11.91
6	23 16 55.44	2.2026	0 47 21.7	13.523	6	1 4 18.37	2.2884	11 8 54.9	11.85
7	23 19 7.62	2.2033	1 0 53.1	13.522	7	1 6 35.76	2.2911	11 20 43.9	11.78
8	23 21 19.84	2.2041	1 14 24.3	13.518	8	1 8 53.30	2.2938	11 32 28.8	11.71
9	23 23 32.11	2.2049	1 27 55.2	13.512	9	1 11 11.02	2.2968	11 44 9.5	11.64
10	23 25 44.43	2.2057	1 41 25.7	13.505	10	1 13 28.91	2.2995	11 55 46.0	11.57
11	23 27 56.79	2.2066	1 54 55.8	13.497	11	1 15 46.96	2.3023	12 7 18.1	11.49
12	23 30 9.22	2.2076	2 8 25.3	13.487	12	1 18 5.19	2.3053	12 18 45.8	11.42
13	23 32 21.70	2.2086	2 21 54.2	13.477	13	1 20 23.59	2.3082	12 30 9.0	11.34
14	23 34 34.25	2.2097	2 35 22.5	13.464	14	1 22 42.17	2.3111	12 41 27.6	11.27
15	23 36 46.86	2.2108	2 48 49.9	13.450	15	1 25 0.92	2.3140	12 52 41.6	11.19
16	23 38 59.54	2.2119	3 2 16.5	13.436	16	1 27 19.85	2.3170	13 3 50.9	11.11
17	23 41 12.29	2.2131	3 15 42.2	13.419	17	1 29 38.96	2.3199	13 14 55.4	11.03
18	23 43 25.11	2.2143	3 29 6.8	13.401	18	1 31 58.24	2.3229	13 25 55.0	10.95
19	23 45 38.01	2.2157	3 42 30.3	13.382	19	1 34 17.71	2.3260	13 36 49.6	10.86
20	23 47 50.99	2.2170	3 55 52.6	13.361	20	1 36 37.36	2.3290	13 47 39.2	10.78
21	23 50 4.05	2.2183	4 9 13.6	13.339	21	1 38 57.19	2.3320	13 58 23.8	10.69
22	23 52 17.19	2.2197	4 22 33.3	13.317	22	1 41 17.20	2.3351	14 9 3.1	10.61
23	23 54 30.42	2.2213	4 35 51.6	13.292	23	1 43 37.40	2.3382	14 19 37.3	10.52
24	23 56 43.74	2.2228	+4 49 8.3	+13.265	24	1 45 57.78	2.3413	+14 30 6.1	+10.43

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 6.			
	h m s	s	° ′ ″	″
0	1 45 57.78	2.3413	+14 30 6.1	+10.435
1	1 48 18.35	2.3444	14 40 29.5	10.345
2	1 50 39.10	2.3474	14 50 47.5	10.253
3	1 53 0.04	2.3505	15 0 59.9	10.161
4	1 55 21.16	2.3536	15 11 6.8	10.068
5	1 57 42.47	2.3568	15 21 8.0	9.972
6	2 0 3.97	2.3598	15 31 3.4	9.875
7	2 2 25.65	2.3629	15 40 53.0	9.778
8	2 4 47.52	2.3661	15 50 36.7	9.679
9	2 7 9.58	2.3692	16 0 14.5	9.580
10	2 9 31.82	2.3723	16 9 46.3	9.479
11	2 11 54.25	2.3753	16 19 12.0	9.378
12	2 14 16.86	2.3784	16 28 31.6	9.275
13	2 16 39.66	2.3815	16 37 45.0	9.170
14	2 19 2.64	2.3846	16 46 52.0	9.065
15	2 21 25.81	2.3877	16 55 52.8	8.959
16	2 23 49.16	2.3908	17 4 47.1	8.852
17	2 26 12.70	2.3938	17 13 35.0	8.743
18	2 28 36.41	2.3967	17 22 16.3	8.633
19	2 31 0.30	2.3998	17 30 51.0	8.523
20	2 33 24.38	2.4028	17 39 19.1	8.412
21	2 35 48.63	2.4056	17 47 40.4	8.299
22	2 38 13.05	2.4086	17 55 55.0	8.187
23	2 40 37.66	2.4115	+18 4 2.8	+8.072
	FEBRUARY 7.			
0	2 43 2.43	2.4143	+18 12 3.6	+7.956
1	2 45 27.38	2.4173	18 19 57.5	7.840
2	2 47 52.50	2.4201	18 27 44.4	7.723
3	2 50 17.79	2.4228	18 35 24.2	7.603
4	2 52 43.24	2.4255	18 42 56.8	7.484
5	2 55 8.85	2.4283	18 50 22.3	7.365
6	2 57 34.63	2.4310	18 57 40.6	7.244
7	3 0 0.57	2.4337	19 4 51.6	7.122
8	3 2 26.67	2.4363	19 11 55.2	6.999
9	3 4 52.92	2.4388	19 18 51.5	6.877
10	3 7 19.32	2.4413	19 25 40.4	6.752
11	3 9 45.88	2.4438	19 32 21.7	6.626
12	3 12 12.58	2.4463	19 38 55.5	6.500
13	3 14 39.43	2.4487	19 45 21.7	6.373
14	3 17 6.42	2.4510	19 51 40.3	6.246
15	3 19 33.55	2.4533	19 57 51.2	6.118
16	3 22 0.81	2.4555	20 3 54.4	5.989
17	3 24 28.21	2.4578	20 9 49.9	5.859
18	3 26 55.74	2.4598	20 15 37.5	5.728
19	3 29 23.39	2.4619	20 21 17.3	5.598
20	3 31 51.17	2.4639	20 26 49.2	5.466
21	3 34 19.06	2.4658	20 32 13.2	5.333
22	3 36 47.07	2.4678	20 37 29.2	5.200
23	3 39 15.19	2.4696	20 42 37.2	5.067
24	3 41 43.42	2.4714	+20 47 37.2	+4.933

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 8.			
	h m s	s	° ′ ″	″
0	3 41 43.42	2.4714	+20 47 37.2	+4.933
1	3 44 11.76	2.4731	20 52 29.1	4.798
2	3 46 40.19	2.4747	20 57 12.9	4.663
3	3 49 8.72	2.4763	21 1 48.6	4.527
4	3 51 37.34	2.4778	21 6 16.1	4.390
5	3 54 6.06	2.4793	21 10 35.4	4.253
6	3 56 34.85	2.4805	21 14 46.5	4.116
7	3 59 3.72	2.4818	21 18 49.3	3.978
8	4 1 32.67	2.4831	21 22 43.9	3.840
9	4 4 1.69	2.4842	21 26 30.1	3.701
10	4 6 30.77	2.4853	21 30 8.0	3.563
11	4 8 59.92	2.4863	21 33 37.6	3.423
12	4 11 29.12	2.4871	21 36 58.8	3.283
13	4 13 58.37	2.4880	21 40 11.6	3.143
14	4 16 27.68	2.4888	21 43 15.9	3.003
15	4 18 57.02	2.4893	21 46 11.9	2.863
16	4 21 26.40	2.4899	21 48 59.4	2.721
17	4 23 55.81	2.4904	21 51 38.4	2.580
18	4 26 25.25	2.4909	21 54 9.0	2.438
19	4 28 54.72	2.4913	21 56 31.0	2.297
20	4 31 24.20	2.4914	21 58 44.6	2.156
21	4 33 53.69	2.4917	22 0 49.7	2.014
22	4 36 23.20	2.4918	22 2 46.3	1.873
23	4 38 52.70	2.4917	+22 4 34.4	+1.730
	FEBRUARY 9.			
0	4 41 22.20	2.4916	+22 6 13.9	+1.588
1	4 43 51.69	2.4914	22 7 44.9	1.446
2	4 46 21.17	2.4912	22 9 7.4	1.303
3	4 48 50.63	2.4908	22 10 21.3	1.161
4	4 51 20.07	2.4904	22 11 26.7	1.019
5	4 53 49.48	2.4898	22 12 23.6	0.877
6	4 56 18.85	2.4892	22 13 11.9	0.734
7	4 58 48.18	2.4886	22 13 51.7	0.593
8	5 1 17.48	2.4878	22 14 23.0	0.451
9	5 3 46.71	2.4868	22 14 45.8	0.309
10	5 6 15.90	2.4859	22 15 0.1	0.168
11	5 8 45.02	2.4848	22 15 5.9	+0.026
12	5 11 14.08	2.4838	22 15 3.2	−0.116
13	5 13 43.07	2.4825	22 14 52.0	0.257
14	5 16 11.98	2.4811	22 14 32.4	0.398
15	5 18 40.80	2.4798	22 14 4.3	0.538
16	5 21 9.55	2.4783	22 13 27.8	0.678
17	5 23 38.19	2.4767	22 12 42.9	0.818
18	5 26 6.75	2.4750	22 11 49.6	0.958
19	5 28 35.19	2.4733	22 10 47.9	1.098
20	5 31 3.54	2.4715	22 9 37.8	1.237
21	5 33 31.77	2.4695	22 8 19.5	1.375
22	5 35 59.88	2.4675	22 6 52.8	1.514
23	5 38 27.87	2.4654	22 5 17.8	1.652
24	5 40 55.73	2.4633	+22 3 34.6	−1.7[illegible]

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 10.					FEBRUARY 12.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 40 55.73	2.4633	+22 3 34.6	−1.789	0	7 35 22.24	2.2853	+18 12 17.4	− 7.518
1	5 43 23.46	2.4610	22 1 43.1	1.926	1	7 37 39.22	2.2806	18 4 43.4	7.613
2	5 45 51.05	2.4587	21 59 43.5	2.063	2	7 39 55.91	2.2758	17 57 3.8	7.708
3	5 48 18.50	2.4563	21 57 35.6	2.198	3	7 42 12.32	2.2713	17 49 18.4	7.803
4	5 50 45.80	2.4538	21 55 19.7	2.333	4	7 44 28.46	2.2665	17 41 27.5	7.895
5	5 53 12.95	2.4513	21 52 55.6	2.469	5	7 46 44.30	2.2618	17 33 31.0	7.987
6	5 55 39.95	2.4486	21 50 23.4	2.603	6	7 48 59.87	2.2571	17 25 29.1	8.077
7	5 58 6.78	2.4458	21 47 43.3	2.736	7	7 51 15.15	2.2523	17 17 21.8	8.167
8	6 0 33.45	2.4431	21 44 55.1	2.870	8	7 53 30.15	2.2476	17 9 9.1	8.255
9	6 2 59.95	2.4402	21 41 58.9	3.002	9	7 55 44.86	2.2428	17 0 51.2	8.341
10	6 5 26.27	2.4373	21 38 54.9	3.133	10	7 57 59.29	2.2382	16 52 28.2	8.427
11	6 7 52.42	2.4343	21 35 42.9	3.265	11	8 0 13.44	2.2334	16 44 0.0	8.513
12	6 10 18.38	2.4312	21 32 23.1	3.395	12	8 2 27.30	2.2286	16 35 26.7	8.596
13	6 12 44.16	2.4280	21 28 55.5	3.524	13	8 4 40.87	2.2238	16 26 48.5	8.678
14	6 15 9.74	2.4248	21 25 20.2	3.653	14	8 6 54.16	2.2192	16 18 5.3	8.759
15	6 17 35.13	2.4215	21 21 37.1	3.783	15	8 9 7.17	2.2144	16 9 17.4	8.839
16	6 20 0.32	2.4182	21 17 46.3	3.910	16	8 11 19.89	2.2097	16 0 24.6	8.919
17	6 22 25.31	2.4148	21 13 47.9	4.036	17	8 13 32.33	2.2049	15 51 27.1	8.997
18	6 24 50.09	2.4113	21 9 42.0	4.162	18	8 15 44.48	2.2002	15 42 25.0	9.073
19	6 27 14.66	2.4078	21 5 28.5	4.288	19	8 17 56.35	2.1955	15 33 18.4	9.148
20	6 29 39.02	2.4042	21 1 7.5	4.413	20	8 20 7.94	2.1908	15 24 7.2	9.223
21	6 32 3.16	2.4005	20 56 39.0	4.536	21	8 22 19.25	2.1861	15 14 51.6	9.297
22	6 34 27.08	2.3968	20 52 3.2	4.658	22	8 24 30.27	2.1813	15 5 31.6	9.368
23	6 36 50.78	2.3931	+20 47 20.0	−4.781	23	8 26 41.01	2.1768	+14 56 7.4	− 9.439
	FEBRUARY 11.					FEBRUARY 13.			
0	6 39 14.25	2.3893	+20 42 29.5	−4.902	0	8 28 51.48	2.1722	+14 46 38.9	− 9.509
1	6 41 37.49	2.3853	20 37 31.8	5.022	1	8 31 1.67	2.1675	14 37 6.3	9.578
2	6 44 0.49	2.3814	20 32 26.9	5.142	2	8 33 11.58	2.1629	14 27 29.6	9.646
3	6 46 23.26	2.3774	20 27 14.8	5.260	3	8 35 21.22	2.1583	14 17 48.8	9.712
4	6 48 45.78	2.3734	20 21 55.7	5.377	4	8 37 30.57	2.1537	14 8 4.2	9.777
5	6 51 8.07	2.3694	20 16 29.6	5.493	5	8 39 39.66	2.1492	13 58 15.6	9.842
6	6 53 30.11	2.3653	20 10 56.5	5.609	6	8 41 48.47	2.1446	13 48 23.2	9.904
7	6 55 51.90	2.3611	20 5 16.5	5.724	7	8 43 57.01	2.1401	13 38 27.1	9.966
8	6 58 13.44	2.3568	19 59 29.6	5.838	8	8 46 5.28	2.1356	13 28 27.3	10.028
9	7 0 34.72	2.3526	19 53 35.9	5.951	9	8 48 13.28	2.1312	13 18 23.8	10.087
10	7 2 55.75	2.3484	19 47 35.5	6.062	10	8 50 21.02	2.1268	13 8 16.9	10.145
11	7 5 16.53	2.3441	19 41 28.5	6.173	11	8 52 28.49	2.1223	12 58 6.4	10.203
12	7 7 37.04	2.3397	19 35 14.8	6.283	12	8 54 35.69	2.1178	12 47 52.5	10.259
13	7 9 57.29	2.3353	19 28 54.6	6.391	13	8 56 42.63	2.1135	12 37 35.3	10.313
14	7 12 17.28	2.3309	19 22 27.9	6.499	14	8 58 49.31	2.1093	12 27 14.9	10.368
15	7 14 37.00	2.3264	19 15 54.7	6.605	15	9 0 55.74	2.1049	12 16 51.2	10.421
16	7 16 56.45	2.3219	19 9 15.3	6.711	16	9 3 1.90	2.1006	12 6 24.4	10.472
17	7 19 15.63	2.3174	19 2 29.4	6.816	17	9 5 7.81	2.0963	11 55 54.6	10.523
18	7 21 34.54	2.3129	18 55 37.4	6.919	18	9 7 13.46	2.0922	11 45 21.7	10.573
19	7 23 53.18	2.3084	18 48 39.1	7.022	19	9 9 18.87	2.0880	11 34 45.8	10.621
20	7 26 11.55	2.3038	18 41 34.8	7.123	20	9 11 24.02	2.0838	11 24 7.2	10.668
21	7 28 29.64	2.2992	18 34 24.4	7.223	21	9 13 28.92	2.0797	11 13 25.6	10.715
22	7 30 47.45	2.2945	18 27 8.0	7.323	22	9 15 33.58	2.0757	11 2 41.4	10.760
23	7 33 4.98	2.2899	18 19 45.6	7.422	23	9 17 38.00	2.0716	10 51 54.4	10.804
24	7 35 22.24	2.2853	+18 12 17.4	−7.518	24	9 19 42.17	2.0676	+10 41 4.9	−10.847

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 14.			
	h m s	s	° ′ ″	″
0	9 19 42.17	2.0676	+10 41 4.9	−10.847
1	9 21 46.11	2.0636	10 30 12.8	10.888
2	9 23 49.80	2.0597	10 19 18.3	10.929
3	9 25 53.27	2.0558	10 8 21.3	10.970
4	9 27 56.50	2.0519	9 57 21.9	11.008
5	9 29 59.50	2.0481	9 46 20.3	11.045
6	9 32 2.27	2.0443	9 35 16.5	11.083
7	9 34 4.81	2.0406	9 24 10.4	11.118
8	9 36 7.14	2.0369	9 13 2.3	11.153
9	9 38 9.24	2.0332	9 1 52.1	11.187
10	9 40 11.12	2.0296	8 50 39.9	11.219
11	9 42 12.79	2.0260	8 39 25.8	11.250
12	9 44 14.24	2.0224	8 28 9.9	11.280
13	9 46 15.48	2.0190	8 16 52.2	11.310
14	9 48 16.52	2.0155	8 5 32.7	11.338
15	9 50 17.34	2.0121	7 54 11.6	11.365
16	9 52 17.97	2.0088	7 42 48.9	11.392
17	9 54 18.39	2.0053	7 31 24.6	11.418
18	9 56 18.61	2.0021	7 19 58.8	11.442
19	9 58 18.64	1.9989	7 8 31.6	11.465
20	10 0 18.48	1.9958	6 57 3.0	11.488
21	10 2 18.13	1.9926	6 45 33.1	11.509
22	10 4 17.59	1.9895	6 34 1.9	11.530
23	10 6 16.87	1.9864	+ 6 22 29.5	−11.549
	FEBRUARY 15.			
0	10 8 15.96	1.9834	+ 6 10 56.0	−11.568
1	10 10 14.88	1.9805	5 59 21.4	11.586
2	10 12 13.62	1.9775	5 47 45.7	11.603
3	10 14 12.18	1.9747	5 36 9.1	11.618
4	10 16 10.58	1.9719	5 24 31.6	11.633
5	10 18 8.81	1.9691	5 12 53.2	11.647
6	10 20 6.87	1.9664	5 1 14.0	11.660
7	10 22 4.78	1.9638	4 49 34.0	11.673
8	10 24 2.52	1.9611	4 37 53.3	11.683
9	10 26 0.11	1.9585	4 26 12.0	11.693
10	10 27 57.54	1.9560	4 14 30.1	11.703
11	10 29 54.83	1.9535	4 2 47.7	11.711
12	10 31 51.96	1.9510	3 51 4.8	11.718
13	10 33 48.95	1.9487	3 39 21.5	11.725
14	10 35 45.80	1.9463	3 27 37.8	11.731
15	10 37 42.51	1.9441	3 15 53.8	11.736
16	10 39 39.09	1.9418	3 4 9.5	11.740
17	10 41 35.53	1.9396	2 52 25.0	11.743
18	10 43 31.84	1.9375	2 40 40.3	11.746
19	10 45 28.03	1.9354	2 28 55.5	11.748
20	10 47 24.09	1.9333	2 17 10.6	11.748
21	10 49 20.03	1.9314	2 5 25.7	11.748
22	10 51 15.86	1.9295	1 53 40.9	11.747
23	10 53 11.57	1.9275	1 41 56.1	11.745
24	10 55 7.16	1.9257	+ 1 30 11.5	−11.742

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 16.			
	h m s	s	° ′ ″	″
0	10 55 7.16	1.9257	+1 30 11.5	−11.742
1	10 57 2.65	1.9239	1 18 27.1	11.738
2	10 58 58.03	1.9222	1 6 42.9	11.734
3	11 0 53.31	1.9205	0 54 59.0	11.729
4	11 2 48.49	1.9188	0 43 15.4	11.723
5	11 4 43.57	1.9172	0 31 32.2	11.716
6	11 6 38.55	1.9157	0 19 49.5	11.708
7	11 8 33.45	1.9143	+0 8 7.2	11.701
8	11 10 28.26	1.9128	−0 3 34.6	11.692
9	11 12 22.98	1.9113	0 15 15.8	11.682
10	11 14 17.62	1.9100	0 26 56.4	11.671
11	11 16 12.18	1.9087	0 38 36.3	11.659
12	11 18 6.66	1.9074	0 50 15.5	11.648
13	11 20 1.07	1.9063	1 1 54.0	11.634
14	11 21 55.41	1.9051	1 13 31.6	11.620
15	11 23 49.68	1.9040	1 25 8.4	11.607
16	11 25 43.89	1.9030	1 36 44.4	11.592
17	11 27 38.04	1.9020	1 48 19.4	11.575
18	11 29 32.13	1.9010	1 59 53.4	11.558
19	11 31 26.16	1.9001	2 11 26.4	11.541
20	11 33 20.14	1.8993	2 22 58.3	11.523
21	11 35 14.07	1.8984	2 34 29.1	11.504
22	11 37 7.95	1.8977	2 45 58.8	11.485
23	11 39 1.79	1.8970	−2 57 27.3	−11.464
	FEBRUARY 17.			
0	11 40 55.59	1.8963	−3 8 54.5	−11.443
1	11 42 49.35	1.8958	3 20 20.5	11.422
2	11 44 43.08	1.8952	3 31 45.1	11.398
3	11 46 36.77	1.8947	3 43 8.3	11.376
4	11 48 30.44	1.8943	3 54 30.2	11.352
5	11 50 24.08	1.8938	4 5 50.5	11.328
6	11 52 17.69	1.8934	4 17 9.5	11.303
7	11 54 11.29	1.8931	4 28 26.9	11.277
8	11 56 4.86	1.8928	4 39 42.7	11.249
9	11 57 58.42	1.8926	4 50 56.8	11.223
10	11 59 51.97	1.8924	5 2 9.4	11.195
11	12 1 45.51	1.8923	5 13 20.2	11.166
12	12 3 39.04	1.8922	5 24 29.3	11.138
13	12 5 32.57	1.8922	5 35 36.7	11.108
14	12 7 26.10	1.8921	5 46 42.2	11.077
15	12 9 19.62	1.8922	5 57 45.9	11.046
16	12 11 13.16	1.8923	6 8 47.7	11.013
17	12 13 6.70	1.8925	6 19 47.5	10.981
18	12 15 0.26	1.8927	6 30 45.4	10.948
19	12 16 53.82	1.8928	6 41 41.3	10.914
20	12 18 47.40	1.8933	6 52 35.1	10.879
21	12 20 41.01	1.8936	7 3 26.8	10.844
22	12 22 34.63	1.8939	7 14 16.4	10.809
23	12 24 28.28	1.8943	7 25 3.9	10.773
24	12 26 21.95	1.8948	−7 35 49.1	−10.7[illegible]

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
		FEBRUARY 18.					FEBRUARY 20.		
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 26 21.95	1.8948	– 7 35 49.1	–10.735	0	13 58 38.36	1.9643	–15 16 53.6	–8.250
1	12 28 15.65	1.8953	7 46 32.1	10.698	1	14 0 36.29	1.9666	15 25 6.6	8.18
2	12 30 9.39	1.8959	7 57 12.8	10.659	2	14 2 34.35	1.9688	15 33 15.7	8.11
3	12 32 3.16	1.8965	8 7 51.2	10.620	3	14 4 32.55	1.9713	15 41 20.7	8.05
4	12 33 56.97	1.8971	8 18 27.2	10.580	4	14 6 30.90	1.9737	15 49 21.7	7.98
5	12 35 50.81	1.8978	8 29 0.8	10.540	5	14 8 29.39	1.9760	15 57 18.7	7.91
6	12 37 44.70	1.8986	8 39 32.0	10.500	6	14 10 28.02	1.9784	16 5 11.5	7.84
7	12 39 38.64	1.8993	8 50 0.8	10.458	7	14 12 26.80	1.9808	16 13 0.1	7.77
8	12 41 32.62	1.9001	9 0 27.0	10.416	8	14 14 25.72	1.9833	16 20 44.6	7.70
9	12 43 26.65	1.9009	9 10 50.7	10.374	9	14 16 24.79	1.9858	16 28 24.9	7.63
10	12 45 20.73	1.9018	9 21 11.9	10.331	10	14 18 24.02	1.9883	16 36 0.9	7.56
11	12 47 14.87	1.9028	9 31 30.4	10.286	11	14 20 23.39	1.9908	16 43 32.6	7.49
12	12 49 9.07	1.9038	9 41 46.2	10.242	12	14 22 22.92	1.9934	16 51 0.0	7.421
13	12 51 3.33	1.9048	9 51 59.4	10.198	13	14 24 22.60	1.9960	16 58 23.1	7.34
14	12 52 57.65	1.9058	10 2 9.9	10.152	14	14 26 22.44	1.9986	17 5 41.8	7.27
15	12 54 52.03	1.9070	10 12 17.6	10.105	15	14 28 22.43	2.0012	17 12 56.0	7.20
16	12 56 46.49	1.9082	10 22 22.5	10.058	16	14 30 22.58	2.0038	17 20 5.8	7.12
17	12 58 41.01	1.9093	10 32 24.6	10.011	17	14 32 22.89	2.0065	17 27 11.2	7.05
18	13 0 35.61	1.9106	10 42 23.8	9.963	18	14 34 23.36	2.0092	17 34 12.0	6.97
19	13 2 30.28	1.9118	10 52 20.1	9.914	19	14 36 23.99	2.0118	17 41 8.2	6.89
20	13 4 25.03	1.9132	11 2 13.5	9.865	20	14 38 24.78	2.0146	17 47 59.9	6.82
21	13 6 19.86	1.9145	11 12 3.9	9.815	21	14 40 25.74	2.0173	17 54 47.0	6.74
22	13 8 14.77	1.9158	11 21 51.3	9.765	22	14 42 26.86	2.0200	18 1 29.4	6.66
23	13 10 9.76	1.9173	–11 31 35.7	– 9.714	23	14 44 28.14	2.0228	–18 8 7.1	–6.58
		FEBRUARY 19.					FEBRUARY 21.		
0	13 12 4.84	1.9188	–11 41 17.0	– 9.663	0	14 46 29.59	2.0255	–18 14 40.1	–6.511
1	13 14 0.01	1.9203	11 50 55.2	9.610	1	14 48 31.20	2.0283	18 21 8.4	6.431
2	13 15 55.27	1.9218	12 0 30.2	9.557	2	14 50 32.98	2.0311	18 27 31.8	6.351
3	13 17 50.63	1.9234	12 10 2.0	9.503	3	14 52 34.93	2.0339	18 33 50.5	6.271
4	13 19 46.08	1.9250	12 19 30.6	9.450	4	14 54 37.05	2.0368	18 40 4.3	6.18
5	13 21 41.63	1.9267	12 28 56.0	9.396	5	14 56 39.34	2.0395	18 46 13.2	6.10
6	13 23 37.28	1.9283	12 38 18.1	9.341	6	14 58 41.79	2.0423	18 52 17.2	6.02
7	13 25 33.03	1.9301	12 47 36.9	9.285	7	15 0 44.42	2.0453	18 58 16.2	5.94
8	13 27 28.89	1.9318	12 56 52.3	9.228	8	15 2 47.22	2.0481	19 4 10.3	5.85
9	13 29 24.85	1.9336	13 6 4.3	9.172	9	15 4 50.19	2.0509	19 9 59.3	5.77
10	13 31 20.92	1.9354	13 15 12.9	9.114	10	15 6 53.33	2.0538	19 15 43.3	5.69
11	13 33 17.10	1.9373	13 24 18.0	9.056	11	15 8 56.64	2.0567	19 21 22.2	5.60
12	13 35 13.39	1.9392	13 33 19.6	8.998	12	15 11 0.13	2.0596	19 26 56.0	5.521
13	13 37 9.80	1.9411	13 42 17.7	8.938	13	15 13 3.79	2.0624	19 32 24.7	5.43
14	13 39 6.32	1.9430	13 51 12.2	8.878	14	15 15 7.62	2.0653	19 37 48.1	5.34
15	13 41 2.96	1.9450	14 0 3.1	8.818	15	15 17 11.63	2.0683	19 43 6.4	5.261
16	13 42 59.72	1.9470	14 8 50.4	8.758	16	15 19 15.81	2.0711	19 48 19.4	5.17
17	13 44 56.60	1.9491	14 17 34.0	8.696	17	15 21 20.16	2.0740	19 53 27.1	5.08
18	13 46 53.61	1.9512	14 26 13.9	8.633	18	15 23 24.69	2.0769	19 58 29.6	4.99
19	13 48 50.74	1.9533	14 34 50.0	8.571	19	15 25 29.39	2.0798	20 3 26.7	4.90
20	13 50 48.00	1.9554	14 43 22.4	8.508	20	15 27 34.27	2.0828	20 8 18.4	4.81
21	13 52 45.39	1.9577	14 51 51.0	8.445	21	15 29 39.32	2.0856	20 13 4.7	4.72
22	13 54 42.92	1.9598	15 0 15.8	8.380	22	15 31 44.54	2.0885	20 17 45.6	4.63
23	13 56 40.57	1.9620	15 8 36.6	8.315	23	15 33 49.94	2.0915	20 22 21.0	4.54
24	13 58 38.36	1.9643	–15 16 53.6	– 8.250	24	15 35 55.52	2.0944	–20 26 50.9	–4.45

GREENWICH MEAN TIME.

FEBRUARY 22.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
0	15	35	55.52	2.0944	−20	26	50.9	−4.453
1	15	38	1.27	2.0973	20	31	15.3	4.360
2	15	40	7.19	2.1001	20	35	34.1	4.267
3	15	42	13.28	2.1029	20	39	47.3	4.173
4	15	44	19.54	2.1058	20	43	54.9	4.080
5	15	46	25.98	2.1088	20	47	56.9	3.985
6	15	48	32.59	2.1116	20	51	53.1	3.890
7	15	50	39.37	2.1144	20	55	43.7	3.795
8	15	52	46.32	2.1173	20	59	28.5	3.698
9	15	54	53.44	2.1201	21	3	7.5	3.602
10	15	57	0.73	2.1228	21	6	40.7	3.505
11	15	59	8.18	2.1257	21	10	8.1	3.408
12	16	1	15.81	2.1285	21	13	29.6	3.309
13	16	3	23.60	2.1313	21	16	45.2	3.211
14	16	5	31.57	2.1341	21	19	54.9	3.113
15	16	7	39.69	2.1368	21	22	58.7	3.013
16	16	9	47.98	2.1395	21	25	56.4	2.913
17	16	11	56.43	2.1423	21	28	48.2	2.813
18	16	14	5.05	2.1450	21	31	33.9	2.712
19	16	16	13.83	2.1477	21	34	13.6	2.611
20	16	18	22.77	2.1503	21	36	47.2	2.508
21	16	20	31.87	2.1529	21	39	14.6	2.406
22	16	22	41.12	2.1556	21	41	35.9	2.304
23	16	24	50.54	2.1583	−21	43	51.1	−2.201

FEBRUARY 23.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
0	16	27	0.11	2.1608	−21	46	0.0	−2.097
1	16	29	9.84	2.1634	21	48	2.7	1.993
2	16	31	19.72	2.1659	21	49	59.2	1.889
3	16	33	29.75	2.1684	21	51	49.4	1.784
4	16	35	39.93	2.1709	21	53	33.3	1.679
5	16	37	50.26	2.1734	21	55	10.9	1.573
6	16	40	0.74	2.1759	21	56	42.1	1.468
7	16	42	11.37	2.1783	21	58	7.0	1.361
8	16	44	22.14	2.1807	21	59	25.4	1.254
9	16	46	33.05	2.1831	22	0	37.5	1.148
10	16	48	44.11	2.1854	22	1	43.1	1.040
11	16	50	55.30	2.1877	22	2	42.3	0.932
12	16	53	6.63	2.1900	22	3	34.9	0.823
13	16	55	18.10	2.1923	22	4	21.0	0.715
14	16	57	29.70	2.1944	22	5	0.7	0.606
15	16	59	41.43	2.1967	22	5	33.7	0.496
16	17	1	53.30	2.1988	22	6	0.2	0.387
17	17	4	5.29	2.2009	22	6	20.1	0.277
18	17	6	17.41	2.2031	22	6	33.4	0.166
19	17	8	29.66	2.2052	22	6	40.0	−0.055
20	17	10	42.03	2.2072	22	6	40.0	+0.056
21	17	12	54.52	2.2092	22	6	33.3	0.167
22	17	15	7.13	2.2112	22	6	20.0	0.278
23	17	17	19.86	2.2131	22	6	0.0	0.390
24	17	19	32.70	2.2150	−22	5	33.2	+0.503

FEBRUARY 24.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
0	17	19	32.70	2.2150	−22	5	33.2	+0.503
1	17	21	45.66	2.2169	22	4	59.7	0.615
2	17	23	58.73	2.2187	22	4	19.4	0.728
3	17	26	11.90	2.2204	22	3	32.4	0.840
4	17	28	25.18	2.2223	22	2	38.6	0.953
5	17	30	38.57	2.2240	22	1	38.0	1.067
6	17	32	52.06	2.2257	22	0	30.6	1.181
7	17	35	5.65	2.2273	21	59	16.3	1.294
8	17	37	19.33	2.2289	21	57	55.3	1.408
9	17	39	33.12	2.2305	21	56	27.4	1.523
10	17	41	46.99	2.2320	21	54	52.6	1.637
11	17	44	0.96	2.2335	21	53	11.0	1.751
12	17	46	15.01	2.2349	21	51	22.5	1.866
13	17	48	29.15	2.2364	21	49	27.1	1.981
14	17	50	43.38	2.2378	21	47	24.8	2.096
15	17	52	57.69	2.2392	21	45	15.6	2.211
16	17	55	12.08	2.2404	21	42	59.5	2.327
17	17	57	26.54	2.2417	21	40	36.4	2.442
18	17	59	41.08	2.2430	21	38	6.5	2.557
19	18	1	55.70	2.2442	21	35	29.6	2.673
20	18	4	10.38	2.2453	21	32	45.7	2.789
21	18	6	25.13	2.2464	21	29	54.9	2.904
22	18	8	39.95	2.2476	21	26	57.2	3.020
23	18	10	54.84	2.2486	−21	23	52.5	+3.136

FEBRUARY 25.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
0	18	13	9.78	2.2495	−21	20	40.9	+3.252
1	18	15	24.78	2.2505	21	17	22.3	3.368
2	18	17	39.84	2.2515	21	13	56.8	3.483
3	18	19	54.96	2.2524	21	10	24.3	3.599
4	18	22	10.13	2.2532	21	6	44.9	3.715
5	18	24	25.34	2.2540	21	2	58.5	3.831
6	18	26	40.61	2.2548	20	59	5.2	3.948
7	18	28	55.92	2.2555	20	55	4.8	4.063
8	18	31	11.27	2.2562	20	50	57.6	4.178
9	18	33	26.66	2.2569	20	46	43.4	4.294
10	18	35	42.10	2.2576	20	42	22.3	4.410
11	18	37	57.57	2.2581	20	37	54.2	4.526
12	18	40	13.07	2.2587	20	33	19.2	4.641
13	18	42	28.61	2.2592	20	28	37.3	4.756
14	18	44	44.17	2.2597	20	23	48.5	4.871
15	18	46	59.77	2.2602	20	18	52.8	4.986
16	18	49	15.39	2.2605	20	13	50.2	5.101
17	18	51	31.03	2.2609	20	8	40.7	5.216
18	18	53	46.70	2.2613	20	3	24.3	5.330
19	18	56	2.39	2.2616	19	58	1.1	5.443
20	18	58	18.09	2.2618	19	52	31.1	5.558
21	19	0	33.81	2.2622	19	46	54.2	5.673
22	19	2	49.55	2.2623	19	41	10.4	5.786
23	19	5	5.29	2.2625	19	35	19.9	5.898
24	19	7	21.05	2.2628	−19	29	22.6	+6.012

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 26.					FEBRUARY 28.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 7 21.05	2.2628	−19 29 22.6	+ 6.012	0	20 55 43.73	2.2483	−12 38 56.4	+10.854
1	19 9 36.82	2.2628	19 23 18.5	6.124	1	20 57 58.62	2.2479	12 28 2.7	10.937
2	19 11 52.59	2.2629	19 17 7.7	6.237	2	21 0 13.48	2.2475	12 17 4.0	11.020
3	19 14 8.37	2.2630	19 10 50.1	6.350	3	21 2 28.32	2.2471	12 6 0.3	11.101
4	19 16 24.15	2.2630	19 4 25.7	6.462	4	21 4 43.13	2.2467	11 54 51.9	11.180
5	19 18 39.93	2.2630	18 57 54.7	6.573	5	21 6 57.92	2.2463	11 43 38.7	11.260
6	19 20 55.71	2.2630	18 51 17.0	6.683	6	21 9 12.69	2.2460	11 32 20.7	11.338
7	19 23 11.49	2.2630	18 44 32.7	6.794	7	21 11 27.44	2.2456	11 20 58.1	11.415
8	19 25 27.27	2.2629	18 37 41.7	6.905	8	21 13 42.16	2.2453	11 9 30.9	11.492
9	19 27 43.04	2.2628	18 30 44.1	7.015	9	21 15 56.87	2.2449	10 57 59.1	11.567
10	19 29 58.81	2.2628	18 23 39.9	7.124	10	21 18 11.55	2.2445	10 46 22.9	11.640
11	19 32 14.57	2.2626	18 16 29.2	7.233	11	21 20 26.21	2.2443	10 34 42.3	11.713
12	19 34 30.32	2.2624	18 9 11.9	7.343	12	21 22 40.86	2.2440	10 22 57.3	11.786
13	19 36 46.06	2.2623	18 1 48.1	7.451	13	21 24 55.49	2.2438	10 11 8.0	11.856
14	19 39 1.79	2.2621	17 54 17.8	7.559	14	21 27 10.11	2.2435	9 59 14.6	11.925
15	19 41 17.51	2.2618	17 46 41.0	7.667	15	21 29 24.71	2.2432	9 47 17.0	11.994
16	19 43 33.21	2.2616	17 38 57.8	7.773	16	21 31 39.29	2.2430	9 35 15.3	12.062
17	19 45 48.90	2.2613	17 31 8.2	7.879	17	21 33 53.87	2.2429	9 23 9.6	12.128
18	19 48 4.57	2.2610	17 23 12.3	7.985	18	21 36 8.44	2.2427	9 10 59.9	12.193
19	19 50 20.22	2.2608	17 15 10.0	8.091	19	21 38 22.99	2.2425	8 58 46.4	12.257
20	19 52 35.86	2.2604	17 7 1.4	8.196	20	21 40 37.54	2.2425	8 46 29.1	12.320
21	19 54 51.47	2.2601	16 58 46.5	8.300	21	21 42 52.09	2.2423	8 34 8.0	12.382
22	19 57 7.07	2.2598	16 50 25.4	8.403	22	21 45 6.62	2.2423	8 21 43.3	12.442
23	19 59 22.65	2.2594	−16 41 58.1	+ 8.507	23	21 47 21.16	2.2423	− 8 9 15.0	+12.501
	FEBRUARY 27.					MARCH 1.			
0	20 1 38.20	2.2590	−16 33 24.6	+ 8.609	0	21 49 35.69	2.2422	− 7 56 43.2	+12.558
1	20 3 53.73	2.2587	16 24 45.0	8.711	1	21 51 50.22	2.2422	7 44 8.0	12.615
2	20 6 9.24	2.2583	16 15 59.3	8.813	2	21 54 4.75	2.2423	7 31 29.4	12.671
3	20 8 24.73	2.2579	16 7 7.5	8.913	3	21 56 19.29	2.2423	7 18 47.5	12.725
4	20 10 40.19	2.2575	15 58 9.7	9.013	4	21 58 33.82	2.2423	7 6 2.4	12.778
5	20 12 55.63	2.2571	15 49 5.9	9.113	5	22 0 48.37	2.2425	6 53 14.2	12.829
6	20 15 11.04	2.2566	15 39 56.1	9.212	6	22 3 2.92	2.2426	6 40 22.9	12.880
7	20 17 26.42	2.2562	15 30 40.5	9.309	7	22 5 17.48	2.2428	6 27 28.6	12.929
8	20 19 41.78	2.2558	15 21 19.0	9.407	8	22 7 32.05	2.2429	6 14 31.4	12.977
9	20 21 57.11	2.2553	15 11 51.7	9.503	9	22 9 46.63	2.2432	6 1 31.4	13.023
10	20 24 12.41	2.2548	15 2 18.7	9.598	10	22 12 1.23	2.2435	5 48 28.7	13.068
11	20 26 27.69	2.2544	14 52 39.9	9.694	11	22 14 15.85	2.2438	5 35 23.3	13.112
12	20 28 42.94	2.2539	14 42 55.4	9.788	12	22 16 30.48	2.2441	5 22 15.3	13.154
13	20 30 58.16	2.2534	14 33 5.3	9.882	13	22 18 45.14	2.2444	5 9 4.8	13.195
14	20 33 13.35	2.2529	14 23 9.6	9.974	14	22 20 59.81	2.2448	4 55 51.9	13.234
15	20 35 28.51	2.2525	14 13 8.4	10.067	15	22 23 14.51	2.2453	4 42 36.7	13.273
16	20 37 43.65	2.2521	14 3 1.6	10.158	16	22 25 29.24	2.2458	4 29 19.2	13.310
17	20 39 58.76	2.2516	13 52 49.5	10.248	17	22 27 44.00	2.2462	4 15 59.5	13.345
18	20 42 13.84	2.2511	13 42 31.9	10.338	18	22 29 58.78	2.2467	4 2 37.8	13.379
19	20 44 28.89	2.2506	13 32 9.0	10.426	19	22 32 13.60	2.2473	3 49 14.0	13.412
20	20 46 43.91	2.2502	13 21 40.8	10.513	20	22 34 28.46	2.2479	3 35 48.4	13.443
21	20 48 58.91	2.2497	13 11 7.4	10.599	21	22 36 43.35	2.2485	3 22 20.9	13.473
22	20 51 13.87	2.2493	13 0 28.9	10.685	22	22 38 58.28	2.2492	3 8 51.7	13.501
23	20 53 28.82	2.2488	12 49 45.2	10.771	23	22 41 13.25	2.2499	2 55 20.8	13.528
24	20 55 43.73	2.2483	−12 38 56.4	+10.854	24	22 43 28.27	2.2507	− 2 41 48.4	+13.553

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 2.			
	h m s	s	° ′ ″	″
0	22 43 28.27	2.2507	−2 41 48.4	+13.553
1	22 45 43.33	2.2514	2 28 14.5	13.577
2	22 47 58.44	2.2523	2 14 39.2	13.600
3	22 50 13.60	2.2531	2 1 2.5	13.621
4	22 52 28.81	2.2540	1 47 24.7	13.640
5	22 54 44.08	2.2549	1 33 45.7	13.658
6	22 56 59.40	2.2558	1 20 5.7	13.674
7	22 59 14.78	2.2569	1 6 24.8	13.689
8	23 1 30.23	2.2580	0 52 43.0	13.703
9	23 3 45.74	2.2590	0 39 0.4	13.715
10	23 6 1.31	2.2601	0 25 17.2	13.726
11	23 8 16.95	2.2613	−0 11 33.3	13.735
12	23 10 32.66	2.2624	+0 2 11.0	13.742
13	23 12 48.44	2.2637	0 15 55.7	13.748
14	23 15 4.30	2.2650	0 29 40.7	13.753
15	23 17 20.24	2.2663	0 43 26.0	13.755
16	23 19 36.26	2.2678	0 57 11.3	13.756
17	23 21 52.37	2.2691	1 10 56.7	13.756
18	23 24 8.55	2.2705	1 24 42.0	13.753
19	23 26 24.83	2.2720	1 38 27.1	13.750
20	23 28 41.19	2.2734	1 52 12.0	13.746
21	23 30 57.64	2.2750	2 5 56.6	13.739
22	23 33 14.19	2.2767	2 19 40.7	13.730
23	23 35 30.84	2.2783	+2 33 24.2	+13.720
	MARCH 3.			
0	23 37 47.58	2.2799	+2 47 7.1	+13.709
1	23 40 4.43	2.2816	3 0 49.3	13.696
2	23 42 21.37	2.2833	3 14 30.6	13.681
3	23 44 38.43	2.2852	3 28 11.0	13.665
4	23 46 55.59	2.2869	3 41 50.4	13.648
5	23 49 12.86	2.2888	3 55 28.7	13.628
6	23 51 30.25	2.2908	4 9 5.7	13.607
7	23 53 47.75	2.2926	4 22 41.5	13.584
8	23 56 5.36	2.2946	4 36 15.8	13.560
9	23 58 23.10	2.2966	4 49 48.7	13.534
10	0 0 40.95	2.2986	5 3 19.9	13.507
11	0 2 58.93	2.3007	5 16 49.5	13.478
12	0 5 17.03	2.3028	5 30 17.3	13.448
13	0 7 35.26	2.3048	5 43 43.2	13.415
14	0 9 53.61	2.3070	5 57 7.1	13.382
15	0 12 12.10	2.3093	6 10 29.0	13.346
16	0 14 30.72	2.3115	6 23 48.6	13.308
17	0 16 49.48	2.3138	6 37 6.0	13.270
18	0 19 8.37	2.3160	6 50 21.0	13.230
19	0 21 27.40	2.3183	7 3 33.6	13.188
20	0 23 46.57	2.3207	7 16 43.6	13.145
21	0 26 5.88	2.3230	7 29 51.0	13.100
22	0 28 25.33	2.3254	7 42 55.6	13.053
23	0 30 44.93	2.3279	7 55 57.4	13.005
24	0 33 4.68	2.3304	+8 8 56.2	+12.955

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 4.			
	h m s	s	° ′ ″	″
0	0 33 4.68	2.3304	+ 8 8 56.2	+12.955
1	0 35 24.58	2.3328	8 21 52.0	12.904
2	0 37 44.62	2.3353	8 34 44.7	12.851
3	0 40 4.82	2.3379	8 47 34.1	12.796
4	0 42 25.17	2.3404	9 0 20.2	12.740
5	0 44 45.67	2.3430	9 13 2.9	12.683
6	0 47 6.33	2.3457	9 25 42.1	12.624
7	0 49 27.15	2.3483	9 38 17.8	12.563
8	0 51 48.13	2.3509	9 50 49.7	12.500
9	0 54 9.26	2.3535	10 3 17.8	12.437
10	0 56 30.55	2.3563	10 15 42.1	12.372
11	0 58 52.01	2.3590	10 28 2.4	12.305
12	1 1 13.63	2.3617	10 40 18.7	12.237
13	1 3 35.41	2.3644	10 52 30.8	12.167
14	1 5 57.36	2.3672	11 4 38.7	12.095
15	1 8 19.47	2.3699	11 16 42.2	12.022
16	1 10 41.75	2.3727	11 28 41.3	11.948
17	1 13 4.19	2.3754	11 40 35.9	11.872
18	1 15 26.80	2.3783	11 52 25.9	11.795
19	1 17 49.58	2.3811	12 4 11.3	11.716
20	1 20 12.53	2.3838	12 15 51.8	11.635
21	1 22 35.64	2.3867	12 27 27.5	11.553
22	1 24 58.93	2.3895	12 38 58.2	11.470
23	1 27 22.38	2.3923	+12 50 23.9	+11.386
	MARCH 5.			
0	1 29 46.00	2.3951	+13 1 44.5	+11.300
1	1 32 9.79	2.3979	13 12 59.9	11.213
2	1 34 33.75	2.4008	13 24 10.0	11.123
3	1 36 57.88	2.4035	13 35 14.7	11.033
4	1 39 22.17	2.4063	13 46 14.0	10.942
5	1 41 46.64	2.4092	13 57 7.7	10.848
6	1 44 11.27	2.4119	14 7 55.8	10.754
7	1 46 36.07	2.4147	14 18 38.2	10.659
8	1 49 1.03	2.4175	14 29 14.9	10.562
9	1 51 26.17	2.4203	14 39 45.7	10.463
10	1 53 51.47	2.4230	14 50 10.5	10.364
11	1 56 16.93	2.4258	15 0 29.4	10.263
12	1 58 42.56	2.4285	15 10 42.1	10.161
13	2 1 8.35	2.4313	15 20 48.7	10.058
14	2 3 34.31	2.4340	15 30 49.0	9.953
15	2 6 0.43	2.4367	15 40 43.0	9.847
16	2 8 26.71	2.4393	15 50 30.6	9.740
17	2 10 53.14	2.4419	16 0 11.8	9.632
18	2 13 19.74	2.4446	16 9 46.4	9.522
19	2 15 46.49	2.4471	16 19 14.4	9.412
20	2 18 13.39	2.4497	16 28 35.8	9.300
21	2 20 40.45	2.4522	16 37 50.4	9.187
22	2 23 7.65	2.4547	16 46 58.2	9.073
23	2 25 35.01	2.4572	16 55 59.2	8.958
24	2 28 2.51	2.4596	+17 4 53.2	+ 8.842

MOON, 1919.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 6.			
	h m s	s	° ′ ″	″
0	2 28 2.51	2.4596	+17 4 53.2	+8.842
1	2 30 30.16	2.4620	17 13 40.2	8.724
2	2 32 57.95	2.4643	17 22 20.1	8.606
3	2 35 25.88	2.4667	17 30 52.9	8.487
4	2 37 53.95	2.4690	17 39 18.5	8.367
5	2 40 22.16	2.4713	17 47 36.9	8.245
6	2 42 50.50	2.4734	17 55 47.9	8.123
7	2 45 18.97	2.4756	18 3 51.6	7.999
8	2 47 47.57	2.4777	18 11 47.8	7.875
9	2 50 16.29	2.4798	18 19 36.6	7.750
10	2 52 45.14	2.4818	18 27 17.8	7.624
11	2 55 14.11	2.4838	18 34 51.5	7.498
12	2 57 43.19	2.4857	18 42 17.5	7.369
13	3 0 12.39	2.4875	18 49 35.8	7.241
14	3 2 41.69	2.4893	18 56 46.4	7.112
15	3 5 11.11	2.4911	19 3 49.2	6.982
16	3 7 40.62	2.4928	19 10 44.2	6.851
17	3 10 10.24	2.4945	19 17 31.3	6.718
18	3 12 39.96	2.4960	19 24 10.4	6.586
19	3 15 9.76	2.4975	19 30 41.6	6.453
20	3 17 39.66	2.4990	19 37 4.8	6.320
21	3 20 9.64	2.5004	19 43 20.0	6.186
22	3 22 39.71	2.5018	19 49 27.1	6.050
23	3 25 9.85	2.5029	+19 55 26.0	+5.914
	MARCH 7.			
0	3 27 40.06	2.5042	+20 1 16.8	+5.778
1	3 30 10.35	2.5053	20 6 59.4	5.641
2	3 32 40.70	2.5063	20 12 33.7	5.503
3	3 35 11.11	2.5073	20 17 59.8	5.366
4	3 37 41.58	2.5083	20 23 17.6	5.227
5	3 40 12.10	2.5091	20 28 27.0	5.088
6	3 42 42.67	2.5099	20 33 28.1	4.949
7	3 45 13.29	2.5106	20 38 20.9	4.809
8	3 47 43.94	2.5112	20 43 5.2	4.668
9	3 50 14.63	2.5118	20 47 41.1	4.528
10	3 52 45.35	2.5122	20 52 8.6	4.388
11	3 55 16.09	2.5125	20 56 27.6	4.246
12	3 57 46.85	2.5128	21 0 38.1	4.104
13	4 0 17.63	2.5131	21 4 40.1	3.963
14	4 2 48.42	2.5133	21 8 33.6	3.821
15	4 5 19.22	2.5133	21 12 18.6	3.678
16	4 7 50.02	2.5133	21 15 55.0	3.535
17	4 10 20.82	2.5133	21 19 22.8	3.393
18	4 12 51.61	2.5130	21 22 42.1	3.250
19	4 15 22.38	2.5128	21 25 52.8	3.106
20	4 17 53.14	2.5125	21 28 54.8	2.963
21	4 20 23.88	2.5120	21 31 48.3	2.820
22	4 22 54.58	2.5115	21 34 33.2	2.677
23	4 25 25.26	2.5109	21 37 9.5	2.533
24	4 27 55.89	2.5102	+21 39 37.1	+2.388

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 8.			
	h m s	s	° ′ ″	″
0	4 27 55.89	2.5102	+21 39 37.1	+2.388
1	4 30 26.48	2.5095	21 41 56.1	2.245
2	4 32 57.03	2.5086	21 44 6.5	2.103
3	4 35 27.51	2.5077	21 46 8.4	1.959
4	4 37 57.95	2.5068	21 48 1.6	1.815
5	4 40 28.32	2.5056	21 49 46.2	1.672
6	4 42 58.62	2.5043	21 51 22.2	1.528
7	4 45 28.84	2.5031	21 52 49.6	1.385
8	4 47 58.99	2.5018	21 54 8.4	1.243
9	4 50 29.06	2.5004	21 55 18.7	1.100
10	4 52 59.04	2.4988	21 56 20.4	0.957
11	4 55 28.92	2.4973	21 57 13.5	0.814
12	4 57 58.71	2.4956	21 57 58.1	0.673
13	5 0 28.39	2.4938	21 58 34.2	0.531
14	5 2 57.97	2.4920	21 59 1.8	0.389
15	5 5 27.43	2.4900	21 59 20.9	0.248
16	5 7 56.77	2.4880	21 59 31.5	+0.107
17	5 10 25.99	2.4859	21 59 33.7	−0.033
18	5 12 55.08	2.4838	21 59 27.5	0.173
19	5 15 24.04	2.4815	21 59 12.9	0.313
20	5 17 52.86	2.4792	21 58 49.9	0.453
21	5 20 21.54	2.4768	21 58 18.5	0.593
22	5 22 50.07	2.4743	21 57 38.8	0.730
23	5 25 18.45	2.4717	+21 56 50.9	−0.868
	MARCH 9.			
0	5 27 46.67	2.4690	+21 55 54.6	−1.007
1	5 30 14.73	2.4663	21 54 50.1	1.143
2	5 32 42.63	2.4636	21 53 37.4	1.279
3	5 35 10.36	2.4607	21 52 16.6	1.416
4	5 37 37.91	2.4578	21 50 47.5	1.552
5	5 40 5.29	2.4548	21 49 10.4	1.686
6	5 42 32.48	2.4517	21 47 25.2	1.820
7	5 44 59.49	2.4485	21 45 32.0	1.954
8	5 47 26.30	2.4453	21 43 30.7	2.088
9	5 49 52.93	2.4421	21 41 21.5	2.220
10	5 52 19.35	2.4387	21 39 4.3	2.352
11	5 54 45.57	2.4353	21 36 39.3	2.483
12	5 57 11.59	2.4319	21 34 6.4	2.613
13	5 59 37.40	2.4283	21 31 25.7	2.743
14	6 2 2.99	2.4248	21 28 37.3	2.872
15	6 4 28.37	2.4212	21 25 41.1	3.000
16	6 6 53.53	2.4174	21 22 37.3	3.128
17	6 9 18.46	2.4137	21 19 25.8	3.254
18	6 11 43.17	2.4099	21 16 6.8	3.380
19	6 14 7.65	2.4061	21 12 40.2	3.506
20	6 16 31.90	2.4022	21 9 6.1	3.630
21	6 18 55.91	2.3982	21 5 24.6	3.753
22	6 21 19.68	2.3942	21 1 35.7	3.877
23	6 23 43.21	2.3902	20 57 39.4	3.998
24	6 26 6.50	2.3861	+20 53 35.9	−4.119

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 10.					MARCH 12.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 26 6.50	2.3861	+20 53 35.9	-4.119	0	8 15 24.22	2.1643	+15 34 19.2	- 8.798
1	6 28 29.54	2.3819	20 49 25.1	4.239	1	8 17 33.94	2.1598	15 25 29.2	8.869
2	6 30 52.33	2.3777	20 45 7.2	4.358	2	8 19 43.39	2.1552	15 16 34.9	8.941
3	6 33 14.86	2.3734	20 40 42.1	4.478	3	8 21 52.56	2.1506	15 7 36.3	9.011
4	6 35 37.14	2.3693	20 36 9.9	4.595	4	8 24 1.46	2.1461	14 58 33.6	9.080
5	6 37 59.17	2.3649	20 31 30.7	4.712	5	8 26 10.09	2.1416	14 49 26.7	9.148
6	6 40 20.93	2.3606	20 26 44.5	4.828	6	8 28 18.45	2.1372	14 40 15.8	9.215
7	6 42 42.44	2.3563	20 21 51.4	4.943	7	8 30 26.55	2.1328	14 31 0.9	9.282
8	6 45 3.68	2.3518	20 16 51.4	5.057	8	8 32 34.38	2.1283	14 21 42.0	9.347
9	6 47 24.65	2.3473	20 11 44.6	5.170	9	8 34 41.94	2.1238	14 12 19.3	9.411
10	6 49 45.36	2.3428	20 6 31.0	5.282	10	8 36 49.24	2.1195	14 2 52.7	9.474
11	6 52 5.79	2.3383	20 1 10.8	5.393	11	8 38 56.28	2.1152	13 53 22.4	9.536
12	6 54 25.96	2.3338	19 55 43.9	5.503	12	8 41 3.06	2.1108	13 43 48.4	9.597
13	6 56 45.85	2.3293	19 50 10.4	5.613	13	8 43 9.58	2.1066	13 34 10.8	9.657
14	6 59 5.47	2.3247	19 44 30.4	5.720	14	8 45 15.85	2.1023	13 24 29.6	9.716
15	7 1 24.81	2.3201	19 38 44.0	5.828	15	8 47 21.86	2.0981	13 14 44.9	9.773
16	7 3 43.88	2.3154	19 32 51.1	5.934	16	8 49 27.62	2.0939	13 4 56.8	9.830
17	7 6 2.66	2.3108	19 26 51.9	6.040	17	8 51 33.13	2.0898	12 55 5.3	9.886
18	7 8 21.17	2.3062	19 20 46.3	6.144	18	8 53 38.39	2.0857	12 45 10.5	9.941
19	7 10 39.40	2.3015	19 14 34.6	6.247	19	8 55 43.41	2.0816	12 35 12.4	9.995
20	7 12 57.35	2.2968	19 8 16.7	6.349	20	8 57 48.18	2.0774	12 25 11.1	10.048
21	7 15 15.01	2.2920	19 1 52.7	6.451	21	8 59 52.70	2.0734	12 15 6.6	10.100
22	7 17 32.39	2.2873	18 55 22.6	6.551	22	9 1 56.99	2.0695	12 4 59.1	10.151
23	7 19 49.49	2.2826	+18 48 46.6	-6.650	23	9 4 1.04	2.0656	+11 54 48.5	-10.201
	MARCH 11.					MARCH 13.			
0	7 22 6.30	2.2778	+18 42 4.6	-6.748	0	9 6 4.86	2.0617	+11 44 35.0	-10.249
1	7 24 22.83	2.2732	18 35 16.8	6.846	1	9 8 8.44	2.0578	11 34 18.6	10.298
2	7 26 39.08	2.2684	18 28 23.1	6.943	2	9 10 11.79	2.0539	11 23 59.3	10.344
3	7 28 55.04	2.2636	18 21 23.7	7.038	3	9 12 14.91	2.0501	11 13 37.3	10.390
4	7 31 10.71	2.2588	18 14 18.6	7.132	4	9 14 17.80	2.0463	11 3 12.5	10.435
5	7 33 26.10	2.2541	18 7 7.9	7.225	5	9 16 20.47	2.0427	10 52 45.1	10.479
6	7 35 41.20	2.2493	17 59 51.6	7.317	6	9 18 22.92	2.0390	10 42 15.0	10.523
7	7 37 56.01	2.2445	17 52 29.9	7.408	7	9 20 25.15	2.0353	10 31 42.4	10.564
8	7 40 10.54	2.2397	17 45 2.7	7.498	8	9 22 27.16	2.0318	10 21 7.3	10.606
9	7 42 24.77	2.2349	17 37 30.1	7.588	9	9 24 28.96	2.0282	10 10 29.7	10.646
10	7 44 38.73	2.2302	17 29 52.2	7.676	10	9 26 30.54	2.0247	9 59 49.8	10.685
11	7 46 52.39	2.2253	17 22 9.0	7.763	11	9 28 31.92	2.0213	9 49 7.5	10.723
12	7 49 5.77	2.2206	17 14 20.7	7.848	12	9 30 33.09	2.0178	9 38 23.0	10.760
13	7 51 18.86	2.2158	17 6 27.3	7.933	13	9 32 34.05	2.0144	9 27 36.3	10.797
14	7 53 31.67	2.2112	16 58 28.8	8.017	14	9 34 34.82	2.0111	9 16 47.4	10.833
15	7 55 44.20	2.2064	16 50 25.3	8.099	15	9 36 35.38	2.0077	9 5 56.4	10.867
16	7 57 56.44	2.2017	16 42 16.9	8.181	16	9 38 35.74	2.0045	8 55 3.4	10.900
17	8 0 8.40	2.1969	16 34 3.6	8.263	17	9 40 35.92	2.0013	8 44 8.4	10.933
18	8 2 20.07	2.1922	16 25 45.4	8.342	18	9 42 35.89	1.9981	8 33 11.5	10.964
19	8 4 31.46	2.1875	16 17 22.6	8.420	19	9 44 35.69	1.9950	8 22 12.7	10.996
20	8 6 42.57	2.1828	16 8 55.0	8.498	20	9 46 35.29	1.9919	8 11 12.0	11.026
21	8 8 53.40	2.1782	16 0 22.8	8.574	21	9 48 34.72	1.9889	8 0 9.6	11.054
22	8 11 3.95	2.1736	15 51 46.1	8.649	22	9 50 33.96	1.9858	7 49 5.5	11.082
23	8 13 14.23	2.1689	15 43 4.9	8.724	23	9 52 33.02	1.9829	7 37 59.8	11.109
24	8 15 24.22	2.1643	+15 34 19.2	-8.798	24	9 54 31.91	1.9800	+ 7 26 52.4	-11.136

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 14.					MARCH 16.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 54 31.91	1.9800	+7 26 52.4	−11.136	0	11 27 7.10	1.8958	− 1 41 33.1	−11.402
1	9 56 30.62	1.9772	7 15 43.5	11.161	1	11 29 0.83	1.8952	1 52 56.8	11.388
2	9 58 29.17	1.9744	7 4 33.1	11.186	2	11 30 54.52	1.8947	2 4 19.6	11.373
3	10 0 27.55	1.9716	6 53 21.2	11.209	3	11 32 48.19	1.8942	2 15 41.5	11.358
4	10 2 25.76	1.9688	6 42 8.0	11.232	4	11 34 41.82	1.8936	2 27 2.5	11.342
5	10 4 23.81	1.9662	6 30 53.4	11.254	5	11 36 35.42	1.8932	2 38 22.5	11.325
6	10 6 21.70	1.9636	6 19 37.5	11.275	6	11 38 29.00	1.8928	2 49 41.5	11.307
7	10 8 19.44	1.9610	6 8 20.4	11.294	7	11 40 22.56	1.8924	3 0 59.3	11.288
8	10 10 17.02	1.9585	5 57 2.2	11.313	8	11 42 16.09	1.8922	3 12 16.1	11.270
9	10 12 14.46	1.9560	5 45 42.8	11.333	9	11 44 9.62	1.8920	3 23 31.7	11.250
10	10 14 11.74	1.9535	5 34 22.3	11.350	10	11 46 3.13	1.8917	3 34 46.1	11.229
11	10 16 8.88	1.9512	5 23 0.8	11.366	11	11 47 56.62	1.8915	3 45 59.2	11.208
12	10 18 5.88	1.9488	5 11 38.4	11.381	12	11 49 50.11	1.8914	3 57 11.1	11.187
13	10 20 2.74	1.9465	5 0 15.1	11.396	13	11 51 43.59	1.8913	4 8 21.6	11.164
14	10 21 59.46	1.9443	4 48 50.9	11.410	14	11 53 37.07	1.8913	4 19 30.8	11.141
15	10 23 56.05	1.9421	4 37 25.9	11.423	15	11 55 30.54	1.8913	4 30 38.5	11.117
16	10 25 52.51	1.9399	4 26 0.1	11.436	16	11 57 24.02	1.8913	4 41 44.8	11.093
17	10 27 48.84	1.9378	4 14 33.6	11.447	17	11 59 17.50	1.8914	4 52 49.6	11.067
18	10 29 45.05	1.9358	4 3 6.5	11.458	18	12 1 10.99	1.8915	5 3 52.8	11.041
19	10 31 41.13	1.9338	3 51 38.7	11.468	19	12 3 4.48	1.8917	5 14 54.5	11.014
20	10 33 37.10	1.9318	3 40 10.4	11.476	20	12 4 57.99	1.8919	5 25 54.5	10.986
21	10 35 32.95	1.9298	3 28 41.6	11.484	21	12 6 51.51	1.8922	5 36 52.8	10.958
22	10 37 28.68	1.9279	3 17 12.3	11.492	22	12 8 45.05	1.8925	5 47 49.5	10.929
23	10 39 24.30	1.9262	+3 5 42.6	−11.498	23	12 10 38.61	1.8928	− 5 58 44.3	−10.899
	MARCH 15.					MARCH 17.			
0	10 41 19.82	1.9244	+2 54 12.5	−11.504	0	12 12 32.19	1.8932	− 6 9 37.4	−10.869
1	10 43 15.23	1.9226	2 42 42.1	11.508	1	12 14 25.79	1.8936	6 20 28.6	10.838
2	10 45 10.53	1.9209	2 31 11.5	11.513	2	12 16 19.42	1.8941	6 31 18.0	10.807
3	10 47 5.74	1.9193	2 19 40.6	11.516	3	12 18 13.08	1.8946	6 42 5.4	10.774
4	10 49 0.85	1.9178	2 8 9.6	11.518	4	12 20 6.77	1.8951	6 52 50.9	10.742
5	10 50 55.87	1.9162	1 56 38.4	11.520	5	12 22 0.49	1.8957	7 3 34.4	10.708
6	10 52 50.79	1.9147	1 45 7.2	11.520	6	12 23 54.25	1.8963	7 14 15.8	10.673
7	10 54 45.63	1.9133	1 33 36.0	11.521	7	12 25 48.05	1.8970	7 24 55.2	10.638
8	10 56 40.38	1.9118	1 22 4.7	11.520	8	12 27 41.89	1.8977	7 35 32.4	10.603
9	10 58 35.05	1.9105	1 10 33.6	11.518	9	12 29 35.77	1.8984	7 46 7.5	10.567
10	11 0 29.64	1.9092	0 59 2.6	11.516	10	12 31 29.70	1.8992	7 56 40.4	10.529
11	11 2 24.15	1.9079	0 47 31.7	11.513	11	12 33 23.67	1.8999	8 7 11.0	10.491
12	11 4 18.59	1.9067	0 36 1.1	11.508	12	12 35 17.69	1.9008	8 17 39.3	10.453
13	11 6 12.95	1.9056	0 24 30.7	11.503	13	12 37 11.76	1.9017	8 28 5.3	10.414
14	11 8 7.26	1.9045	0 13 0.7	11.498	14	12 39 5.89	1.9027	8 38 29.0	10.374
15	11 10 1.49	1.9033	+0 1 30.9	11.493	15	12 41 0.08	1.9036	8 48 50.2	10.333
16	11 11 55.66	1.9023	−0 9 58.4	11.485	16	12 42 54.32	1.9045	8 59 9.0	10.293
17	11 13 49.77	1.9013	0 21 27.3	11.478	17	12 44 48.62	1.9056	9 9 25.3	10.251
18	11 15 43.82	1.9004	0 32 55.7	11.468	18	12 46 42.99	1.9067	9 19 39.1	10.208
19	11 17 37.82	1.8996	0 44 23.5	11.459	19	12 48 37.42	1.9078	9 29 50.3	10.166
20	11 19 31.77	1.8988	0 55 50.8	11.449	20	12 50 31.92	1.9088	9 39 59.0	10.123
21	11 21 25.67	1.8979	1 7 17.4	11.438	21	12 52 26.48	1.9100	9 50 5.0	10.078
22	11 23 19.52	1.8972	1 18 43.4	11.427	22	12 54 21.12	1.9113	10 0 8.3	10.033
23	11 25 13.33	1.8965	1 30 8.6	11.414	23	12 56 15.83	1.9124	10 10 8.9	9.987
24	11 27 7.10	1.8958	−1 41 33.1	−11.402	24	12 58 10.61	1.9137	−10 20 6.7	− 9.940

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 18.					MARCH 20.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 58 10.61	1.9137	−10 20 6.7	−9.940	0	14 32 1.57	2.0053	−17 12 11.2	−6.999
1	13 0 5.47	1.9150	10 30 1.7	9.894	1	14 34 1.96	2.0077	17 19 8.9	6.923
2	13 2 0.41	1.9163	10 39 54.0	9.847	2	14 36 2.49	2.0100	17 26 2.0	6.847
3	13 3 55.43	1.9178	10 49 43.3	9.798	3	14 38 3.16	2.0123	17 32 50.5	6.770
4	13 5 50.54	1.9191	10 59 29.8	9.750	4	14 40 3.97	2.0148	17 39 34.4	6.693
5	13 7 45.72	1.9205	11 9 13.3	9.700	5	14 42 4.93	2.0172	17 46 13.7	6.615
6	13 9 41.00	1.9220	11 18 53.8	9.650	6	14 44 6.03	2.0195	17 52 48.2	6.537
7	13 11 36.36	1.9234	11 28 31.3	9.599	7	14 46 7.27	2.0219	17 59 18.1	6.458
8	13 13 31.81	1.9250	11 38 5.7	9.548	8	14 48 8.66	2.0243	18 5 43.2	6.378
9	13 15 27.36	1.9266	11 47 37.0	9.496	9	14 50 10.19	2.0268	18 12 3.5	6.298
10	13 17 23.00	1.9281	11 57 5.2	9.443	10	14 52 11.87	2.0292	18 18 19.0	6.218
11	13 19 18.73	1.9297	12 6 30.2	9.390	11	14 54 13.69	2.0316	18 24 29.7	6.138
12	13 21 14.56	1.9313	12 15 52.0	9.336	12	14 56 15.66	2.0340	18 30 35.5	6.056
13	13 23 10.49	1.9330	12 25 10.5	9.282	13	14 58 17.77	2.0364	18 36 36.4	5.974
14	13 25 6.52	1.9348	12 34 25.8	9.227	14	15 0 20.03	2.0388	18 42 32.4	5.892
15	13 27 2.66	1.9364	12 43 37.7	9.171	15	15 2 22.43	2.0413	18 48 23.4	5.808
16	13 28 58.89	1.9382	12 52 46.3	9.115	16	15 4 24.98	2.0438	18 54 9.4	5.724
17	13 30 55.24	1.9400	13 1 51.5	9.058	17	15 6 27.68	2.0462	18 59 50.3	5.640
18	13 32 51.69	1.9418	13 10 53.2	9.000	18	15 8 30.52	2.0485	19 5 26.2	5.556
19	13 34 48.25	1.9436	13 19 51.5	8.943	19	15 10 33.50	2.0509	19 10 57.0	5.471
20	13 36 44.92	1.9454	13 28 46.3	8.883	20	15 12 36.63	2.0533	19 16 22.7	5.386
21	13 38 41.70	1.9473	13 37 37.5	8.824	21	15 14 39.90	2.0558	19 21 43.3	5.299
22	13 40 38.59	1.9492	13 46 25.2	8.764	22	15 16 43.32	2.0582	19 26 58.6	5.213
23	13 42 35.60	1.9511	−13 55 9.2	−8.703	23	15 18 46.88	2.0606	−19 32 8.8	−5.126
	MARCH 19.					MARCH 21.			
0	13 44 32.72	1.9530	−14 3 49.6	−8.643	0	15 20 50.59	2.0630	−19 37 13.7	−5.038
1	13 46 29.96	1.9550	14 12 26.3	8.581	1	15 22 54.44	2.0654	19 42 13.3	4.950
2	13 48 27.32	1.9570	14 20 59.3	8.518	2	15 24 58.44	2.0678	19 47 7.7	4.862
3	13 50 24.80	1.9590	14 29 28.5	8.455	3	15 27 2.58	2.0703	19 51 56.7	4.773
4	13 52 22.40	1.9611	14 37 53.9	8.392	4	15 29 6.87	2.0727	19 56 40.4	4.684
5	13 54 20.13	1.9632	14 46 15.5	8.328	5	15 31 11.30	2.0750	20 1 18.8	4.593
6	13 56 17.98	1.9652	14 54 33.2	8.263	6	15 33 15.87	2.0773	20 5 51.6	4.503
7	13 58 15.95	1.9673	15 2 47.0	8.198	7	15 35 20.58	2.0797	20 10 19.1	4.413
8	14 0 14.05	1.9693	15 10 56.9	8.132	8	15 37 25.43	2.0820	20 14 41.1	4.321
9	14 2 12.27	1.9715	15 19 2.8	8.065	9	15 39 30.42	2.0844	20 18 57.6	4.229
10	14 4 10.63	1.9737	15 27 4.7	7.998	10	15 41 35.56	2.0868	20 23 8.6	4.138
11	14 6 9.11	1.9758	15 35 2.6	7.931	11	15 43 40.83	2.0890	20 27 14.1	4.045
12	14 8 7.72	1.9779	15 42 56.4	7.863	12	15 45 46.24	2.0913	20 31 14.0	3.952
13	14 10 6.46	1.9802	15 50 46.1	7.793	13	15 47 51.79	2.0937	20 35 8.3	3.858
14	14 12 5.34	1.9824	15 58 31.6	7.724	14	15 49 57.48	2.0959	20 38 57.0	3.764
15	14 14 4.35	1.9847	16 6 13.0	7.654	15	15 52 3.30	2.0982	20 42 40.0	3.670
16	14 16 3.50	1.9868	16 13 50.1	7.583	16	15 54 9.26	2.1005	20 46 17.4	3.575
17	14 18 2.77	1.9891	16 21 23.0	7.512	17	15 56 15.36	2.1028	20 49 49.0	3.480
18	14 20 2.19	1.9914	16 28 51.5	7.440	18	15 58 21.59	2.1049	20 53 15.0	3.385
19	14 22 1.74	1.9937	16 36 15.8	7.368	19	16 0 27.95	2.1071	20 56 35.2	3.288
20	14 24 1.43	1.9960	16 43 35.7	7.296	20	16 2 34.44	2.1093	20 59 49.6	3.192
21	14 26 1.26	1.9983	16 50 51.3	7.223	21	16 4 41.07	2.1115	21 2 58.2	3.095
22	14 28 1.22	2.0006	16 58 2.4	7.148	22	16 6 47.82	2.1137	21 6 1.0	2.998
23	14 30 1.33	2.0029	17 5 9.0	7.073	23	16 8 54.71	2.1158	21 8 58.0	2.901
24	14 32 1.57	2.0053	−17 12 11.2	−6.999	24	16 11 1.72	2.1179	−21 11 49.1	−2.808

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 22.					MARCH 24.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 11 1.72	2.1179	−21 11 49.1	−2.803	0	17 54 41.75	2.1913	−21 27 38.0	+2.233
1	16 13 8.86	2.1201	21 14 34.3	2.705	1	17 56 53.25	2.1921	21 25 20.8	2.341
2	16 15 16.13	2.1222	21 17 13.7	2.606	2	17 59 4.80	2.1928	21 22 57.1	2.450
3	16 17 23.52	2.1243	21 19 47.0	2.507	3	18 1 16.39	2.1937	21 20 26.8	2.559
4	16 19 31.04	2.1263	21 22 14.5	2.408	4	18 3 28.04	2.1944	21 17 50.0	2.668
5	16 21 38.68	2.1283	21 24 35.9	2.308	5	18 5 39.72	2.1951	21 15 6.6	2.778
6	16 23 46.44	2.1303	21 26 51.4	2.208	6	18 7 51.45	2.1959	21 12 16.6	2.887
7	16 25 54.32	2.1323	21 29 0.8	2.107	7	18 10 3.23	2.1966	21 9 20.2	2.996
8	16 28 2.31	2.1343	21 31 4.2	2.007	8	18 12 15.04	2.1972	21 6 17.1	3.106
9	16 30 10.43	2.1362	21 33 1.6	1.905	9	18 14 26.89	2.1978	21 3 7.5	3.214
10	16 32 18.65	2.1381	21 34 52.8	1.803	10	18 16 38.77	2.1984	20 59 51.4	3.323
11	16 34 27.00	2.1400	21 36 38.0	1.702	11	18 18 50.70	2.1990	20 56 28.7	3.433
12	16 36 35.45	2.1418	21 38 17.0	1.599	12	18 21 2.65	2.1995	20 52 59.5	3.542
13	16 38 44.02	2.1437	21 39 49.9	1.497	13	18 23 14.64	2.2000	20 49 23.7	3.651
14	16 40 52.69	2.1455	21 41 16.6	1.394	14	18 25 26.65	2.2005	20 45 41.4	3.760
15	16 43 1.48	2.1473	21 42 37.2	1.292	15	18 27 38.70	2.2010	20 41 52.5	3.869
16	16 45 10.37	2.1491	21 43 51.6	1.188	16	18 29 50.77	2.2014	20 37 57.1	3.978
17	16 47 19.37	2.1508	21 44 59.8	1.084	17	18 32 2.87	2.2018	20 33 55.2	4.087
18	16 49 28.47	2.1525	21 46 1.7	0.980	18	18 34 14.99	2.2023	20 29 46.7	4.196
19	16 51 37.67	2.1543	21 46 57.4	0.876	19	18 36 27.14	2.2026	20 25 31.7	4.304
20	16 53 46.98	2.1559	21 47 46.8	0.772	20	18 38 39.30	2.2029	20 21 10.2	4.412
21	16 55 56.38	2.1576	21 48 30.0	0.668	21	18 40 51.49	2.2033	20 16 42.3	4.520
22	16 58 5.89	2.1592	21 49 6.9	0.562	22	18 43 3.70	2.2036	20 12 7.8	4.629
23	17 0 15.48	2.1608	−21 49 37.4	−0.457	23	18 45 15.92	2.2038	−20 7 26.8	+4.737
	MARCH 23.					MARCH 25.			
0	17 2 25.18	2.1624	−21 50 1.7	−0.352	0	18 47 28.16	2.2042	−20 2 39.4	+4.844
1	17 4 34.97	2.1639	21 50 19.6	0.246	1	18 49 40.42	2.2044	19 57 45.5	4.953
2	17 6 44.85	2.1654	21 50 31.2	0.141	2	18 51 52.69	2.2046	19 52 45.1	5.061
3	17 8 54.82	2.1668	21 50 36.5	−0.034	3	18 54 4.97	2.2048	19 47 38.2	5.168
4	17 11 4.87	2.1683	21 50 35.3	+0.073	4	18 56 17.27	2.2050	19 42 25.0	5.275
5	17 13 15.01	2.1698	21 50 27.8	0.178	5	18 58 29.57	2.2052	19 37 5.2	5.382
6	17 15 25.24	2.1712	21 50 13.9	0.286	6	19 0 41.89	2.2053	19 31 39.1	5.488
7	17 17 35.55	2.1725	21 49 53.5	0.393	7	19 2 54.21	2.2055	19 26 6.6	5.596
8	17 19 45.94	2.1738	21 49 26.7	0.499	8	19 5 6.55	2.2057	19 20 27.6	5.703
9	17 21 56.41	2.1751	21 48 53.6	0.607	9	19 7 18.89	2.2057	19 14 42.3	5.808
10	17 24 6.95	2.1763	21 48 13.9	0.714	10	19 9 31.23	2.2058	19 8 50.7	5.914
11	17 26 17.57	2.1777	21 47 27.9	0.822	11	19 11 43.58	2.2058	19 2 52.6	6.020
12	17 28 28.27	2.1789	21 46 35.3	0.930	12	19 13 55.93	2.2059	18 56 48.3	6.125
13	17 30 39.04	2.1801	21 45 36.3	1.038	13	19 16 8.29	2.2059	18 50 37.6	6.231
14	17 32 49.88	2.1813	21 44 30.8	1.146	14	19 18 20.64	2.2059	18 44 20.6	6.335
15	17 35 0.79	2.1823	21 43 18.8	1.254	15	19 20 33.00	2.2060	18 37 57.4	6.440
16	17 37 11.76	2.1834	21 42 0.3	1.362	16	19 22 45.36	2.2060	18 31 27.8	6.545
17	17 39 22.80	2.1845	21 40 35.4	1.470	17	19 24 57.72	2.2060	18 24 52.0	6.648
18	17 41 33.90	2.1856	21 39 3.9	1.579	18	19 27 10.08	2.2060	18 18 10.0	6.752
19	17 43 45.07	2.1866	21 37 25.9	1.688	19	19 29 22.44	2.2059	18 11 21.8	6.856
20	17 45 56.29	2.1875	21 35 41.4	1.797	20	19 31 34.79	2.2059	18 4 27.3	6.959
21	17 48 7.57	2.1885	21 33 50.3	1.905	21	19 33 47.15	2.2059	17 57 26.7	7.061
22	17 50 18.91	2.1894	21 31 52.8	2.013	22	19 35 59.50	2.2058	17 50 20.0	7.163
23	17 52 30.30	2.1903	21 29 48.7	2.123	23	19 38 11.85	2.2058	17 43 7.1	7.266
24	17 54 41.75	2.1913	−21 27 38.0	+2.233	24	19 40 24.19	2.2057	−17 35 48.1	+7.368

GREENWICH MEAN TIME.

MARCH 26.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	19 40 24.19	2.2057	−17 35 48.1	+ 7.368
1	19 42 36.53	2.2057	17 28 23.0	7.468
2	19 44 48.87	2.2056	17 20 51.9	7.569
3	19 47 1.20	2.2055	17 13 14.7	7.670
4	19 49 13.53	2.2055	17 5 31.5	7.770
5	19 51 25.86	2.2054	16 57 42.3	7.870
6	19 53 38.18	2.2053	16 49 47.1	7.968
7	19 55 50.50	2.2053	16 41 46.1	8.067
8	19 58 2.81	2.2051	16 33 39.1	8.166
9	20 0 15.11	2.2050	16 25 26.2	8.263
10	20 2 27.41	2.2049	16 17 7.5	8.361
11	20 4 39.70	2.2048	16 8 42.9	8.458
12	20 6 51.99	2.2048	16 0 12.6	8.553
13	20 9 4.28	2.2048	15 51 36.5	8.649
14	20 11 16.56	2.2047	15 42 54.7	8.745
15	20 13 28.84	2.2046	15 34 7.1	8.840
16	20 15 41.11	2.2046	15 25 13.9	8.933
17	20 17 53.39	2.2046	15 16 15.1	9.028
18	20 20 5.66	2.2044	15 7 10.6	9.121
19	20 22 17.92	2.2044	14 58 0.6	9.213
20	20 24 30.19	2.2044	14 48 45.1	9.305
21	20 26 42.45	2.2044	14 39 24.0	9.397
22	20 28 54.72	2.2044	14 29 57.5	9.487
23	20 31 6.98	2.2043	−14 20 25.6	+ 9.577

MARCH 27.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	20 33 19.24	2.2044	−14 10 48.3	+ 9.667
1	20 35 31.51	2.2044	14 1 5.6	9.755
2	20 37 43.77	2.2044	13 51 17.7	9.843
3	20 39 56.04	2.2046	13 41 24.4	9.932
4	20 42 8.32	2.2047	13 31 25.9	10.018
5	20 44 20.60	2.2048	13 21 22.3	10.104
6	20 46 32.89	2.2048	13 11 13.4	10.190
7	20 48 45.18	2.2049	13 0 59.5	10.274
8	20 50 57.48	2.2051	12 50 40.5	10.358
9	20 53 9.79	2.2052	12 40 16.5	10.442
10	20 55 22.10	2.2054	12 29 47.5	10.525
11	20 57 34.44	2.2057	12 19 13.5	10.607
12	20 59 46.78	2.2058	12 8 34.7	10.687
13	21 1 59.14	2.2061	11 57 51.1	10.768
14	21 4 11.51	2.2063	11 47 2.6	10.847
15	21 6 23.90	2.2066	11 36 9.5	10.925
16	21 8 36.30	2.2069	11 25 11.6	11.003
17	21 10 48.73	2.2073	11 14 9.1	11.080
18	21 13 1.17	2.2076	11 3 2.0	11.156
19	21 15 13.64	2.2080	10 51 50.4	11.232
20	21 17 26.13	2.2083	10 40 34.2	11.306
21	21 19 38.64	2.2088	10 29 13.7	11.379
22	21 21 51.18	2.2093	10 17 48.7	11.452
23	21 24 3.75	2.2098	10 6 19.5	11.523
24	21 26 16.35	2.2103	− 9 54 45.9	+11.595

MARCH 28.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	21 26 16.35	2.2103	−9 54 45.9	+11.595
1	21 28 28.98	2.2108	9 43 8.1	11.664
2	21 30 41.65	2.2114	9 31 26.2	11.733
3	21 32 54.35	2.2120	9 19 40.1	11.802
4	21 35 7.09	2.2126	9 7 50.0	11.868
5	21 37 19.86	2.2133	8 55 55.9	11.934
6	21 39 32.68	2.2140	8 43 57.9	11.999
7	21 41 45.54	2.2148	8 31 56.0	12.063
8	21 43 58.45	2.2155	8 19 50.3	12.127
9	21 46 11.40	2.2163	8 7 40.8	12.189
10	21 48 24.40	2.2171	7 55 27.6	12.249
11	21 50 37.45	2.2179	7 43 10.9	12.309
12	21 52 50.55	2.2188	7 30 50.5	12.368
13	21 55 3.71	2.2198	7 18 26.7	12.426
14	21 57 16.92	2.2207	7 5 59.4	12.483
15	21 59 30.19	2.2217	6 53 28.8	12.538
16	22 1 43.52	2.2228	6 40 54.8	12.593
17	22 3 56.92	2.2238	6 28 17.7	12.646
18	22 6 10.38	2.2250	6 15 37.3	12.698
19	22 8 23.92	2.2262	6 2 53.9	12.748
20	22 10 37.52	2.2273	5 50 7.5	12.798
21	22 12 51.19	2.2285	5 37 18.1	12.848
22	22 15 4.94	2.2298	5 24 25.8	12.894
23	22 17 18.77	2.2311	−5 11 30.8	+12.940

MARCH 29.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
0	22 19 32.67	2.2324	−4 58 33.0	+12.985
1	22 21 46.66	2.2338	4 45 32.6	13.029
2	22 24 0.73	2.2353	4 32 29.5	13.072
3	22 26 14.89	2.2368	4 19 24.0	13.113
4	22 28 29.14	2.2383	4 6 16.0	13.153
5	22 30 43.48	2.2398	3 53 5.7	13.192
6	22 32 57.92	2.2414	3 39 53.0	13.229
7	22 35 12.45	2.2430	3 26 38.2	13.264
8	22 37 27.08	2.2447	3 13 21.3	13.299
9	22 39 41.81	2.2464	3 0 2.3	13.333
10	22 41 56.65	2.2482	2 46 41.4	13.364
11	22 44 11.59	2.2499	2 33 18.6	13.395
12	22 46 26.64	2.2518	2 19 54.0	13.424
13	22 48 41.80	2.2537	2 6 27.7	13.452
14	22 50 57.08	2.2556	1 52 59.8	13.478
15	22 53 12.47	2.2575	1 39 30.3	13.503
16	22 55 27.98	2.2596	1 25 59.4	13.527
17	22 57 43.62	2.2616	1 12 27.1	13.548
18	22 59 59.37	2.2637	0 58 53.6	13.569
19	23 2 15.26	2.2658	0 45 18.8	13.588
20	23 4 31.27	2.2680	0 31 43.0	13.606
21	23 6 47.42	2.2703	0 18 6.1	13.623
22	23 9 3.70	2.2724	−0 4 28.3	13.637
23	23 11 20.11	2.2748	+0 9 10.3	13.650
24	23 13 36.67	2.2772	+0 22 49.7	+13.662

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 30.					APRIL 1.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 13 36.67	2.2772	+ 0 22 49.7	+13.662	0	1 6 19.60	2.4306	+11 0 43.5	+12.256
1	23 15 53.37	2.2795	0 36 29.7	13.672	1	1 8 45.55	2.4343	11 12 56.7	12.184
2	23 18 10.21	2.2819	0 50 10.3	13.680	2	1 11 11.72	2.4380	11 25 5.6	12.111
3	23 20 27.20	2.2844	1 3 51.3	13.687	3	1 13 38.11	2.4418	11 37 10.0	12.035
4	23 22 44.34	2.2869	1 17 32.7	13.692	4	1 16 4.73	2.4455	11 49 9.8	11.958
5	23 25 1.63	2.2895	1 31 14.3	13.696	5	1 18 31.57	2.4492	12 1 4.9	11.878
6	23 27 19.08	2.2922	1 44 56.2	13.698	6	1 20 58.63	2.4529	12 12 55.2	11.797
7	23 29 36.69	2.2948	1 58 38.1	13.698	7	1 23 25.92	2.4567	12 24 40.6	11.715
8	23 31 54.45	2.2974	2 12 20.0	13.698	8	1 25 53.43	2.4603	12 36 21.0	11.632
9	23 34 12.38	2.3001	2 26 1.8	13.696	9	1 28 21.16	2.4640	12 47 56.4	11.546
10	23 36 30.46	2.3028	2 39 43.5	13.692	10	1 30 49.11	2.4677	12 59 26.5	11.458
11	23 38 48.72	2.3058	2 53 24.8	13.685	11	1 33 17.28	2.4713	13 10 51.3	11.369
12	23 41 7.15	2.3086	3 7 5.7	13.678	12	1 35 45.67	2.4750	13 22 10.8	11.279
13	23 43 25.75	2.3113	3 20 46.1	13.668	13	1 38 14.28	2.4787	13 33 24.8	11.186
14	23 45 44.51	2.3143	3 34 25.9	13.658	14	1 40 43.11	2.4823	13 44 33.1	11.092
15	23 48 3.46	2.3173	3 48 5.0	13.645	15	1 43 12.15	2.4858	13 55 35.8	10.997
16	23 50 22.58	2.3203	4 1 43.3	13.631	16	1 45 41.41	2.4894	14 6 32.7	10.899
17	23 52 41.89	2.3233	4 15 20.7	13.615	17	1 48 10.88	2.4930	14 17 23.7	10.800
18	23 55 1.37	2.3263	4 28 57.1	13.598	18	1 50 40.57	2.4965	14 28 8.7	10.700
19	23 57 21.04	2.3294	4 42 32.4	13.578	19	1 53 10.46	2.4999	14 38 47.7	10.598
20	23 59 40.90	2.3325	4 56 6.5	13.557	20	1 55 40.56	2.5035	14 49 20.5	10.494
21	0 2 0.94	2.3357	5 9 39.2	13.534	21	1 58 10.88	2.5069	14 59 47.0	10.389
22	0 4 21.18	2.3389	5 23 10.6	13.510	22	2 0 41.39	2.5103	15 10 7.2	10.283
23	0 6 41.61	2.3421	+ 5 36 40.4	+13.483	23	2 3 12.11	2.5137	+15 20 21.0	+10.175
	MARCH 31.					APRIL 2.			
0	0 9 2.23	2.3453	+ 5 50 8.6	+13.456	0	2 5 43.03	2.5170	+15 30 28.2	+10.065
1	0 11 23.05	2.3487	6 3 35.1	13.426	1	2 8 14.15	2.5203	15 40 28.8	9.954
2	0 13 44.07	2.3520	6 16 59.7	13.394	2	2 10 45.47	2.5236	15 50 22.7	9.842
3	0 16 5.29	2.3553	6 30 22.4	13.361	3	2 13 16.98	2.5268	16 0 9.8	9.728
4	0 18 26.70	2.3587	6 43 43.0	13.326	4	2 15 48.68	2.5299	16 9 50.0	9.613
5	0 20 48.33	2.3621	6 57 1.5	13.289	5	2 18 20.57	2.5330	16 19 23.3	9.496
6	0 23 10.15	2.3655	7 10 17.7	13.251	6	2 20 52.64	2.5361	16 28 49.5	9.378
7	0 25 32.19	2.3690	7 23 31.6	13.211	7	2 23 24.90	2.5392	16 38 8.6	9.258
8	0 27 54.43	2.3724	7 36 43.0	13.169	8	2 25 57.34	2.5421	16 47 20.5	9.138
9	0 30 16.88	2.3760	7 49 51.9	13.125	9	2 28 29.95	2.5449	16 56 25.1	9.015
10	0 32 39.55	2.3795	8 2 58.0	13.079	10	2 31 2.73	2.5478	17 5 22.3	8.892
11	0 35 2.42	2.3830	8 16 1.4	13.033	11	2 33 35.69	2.5507	17 14 12.1	8.768
12	0 37 25.51	2.3866	8 29 1.9	12.983	12	2 36 8.81	2.5533	17 22 54.4	8.642
13	0 39 48.81	2.3902	8 41 59.4	12.933	13	2 38 42.09	2.5560	17 31 29.1	8.514
14	0 42 12.33	2.3938	8 54 53.8	12.880	14	2 41 15.53	2.5587	17 39 56.1	8.386
15	0 44 36.07	2.3974	9 7 45.0	12.825	15	2 43 49.13	2.5612	17 48 15.4	8.257
16	0 47 0.02	2.4011	9 20 32.8	12.768	16	2 46 22.87	2.5636	17 56 26.9	8.126
17	0 49 24.20	2.4048	9 33 17.2	12.711	17	2 48 56.76	2.5660	18 4 30.5	7.994
18	0 51 48.59	2.4083	9 45 58.1	12.652	18	2 51 30.79	2.5683	18 12 26.2	7.862
19	0 54 13.20	2.4121	9 58 35.4	12.590	19	2 54 4.96	2.5707	18 20 14.0	7.728
20	0 56 38.04	2.4158	10 11 8.9	12.527	20	2 56 39.27	2.5728	18 27 53.6	7.593
21	0 59 3.09	2.4194	10 23 38.6	12.462	21	2 59 13.70	2.5748	18 35 25.2	7.458
22	1 1 28.37	2.4232	10 36 4.3	12.395	22	3 1 48.25	2.5769	18 42 48.6	7.321
23	1 3 53.88	2.4269	10 48 26.0	12.327	23	3 4 22.93	2.5789	18 50 3.7	7.183
24	1 6 19.60	2.4306	+11 0 43.5	+12.256	24	3 6 57.72	2.5808	+18 57 10.6	+ 7.045

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
APRIL 3.								
0	3	6	57.72	2.5808	+18	57	10.6	+7.045
1	3	9	32.62	2.5825	19	4	9.1	6.905
2	3	12	7.62	2.5842	19	10	59.2	6.764
3	3	14	42.72	2.5858	19	17	40.8	6.623
4	3	17	17.92	2.5873	19	24	13.9	6.480
5	3	19	53.20	2.5888	19	30	38.4	6.338
6	3	22	28.57	2.5902	19	36	54.4	6.194
7	3	25	4.02	2.5914	19	43	1.7	6.050
8	3	27	39.54	2.5925	19	49	0.4	5.905
9	3	30	15.12	2.5936	19	54	50.3	5.759
10	3	32	50.77	2.5946	20	0	31.5	5.613
11	3	35	26.47	2.5954	20	6	3.9	5.467
12	3	38	2.22	2.5962	20	11	27.5	5.319
13	3	40	38.01	2.5969	20	16	42.2	5.171
14	3	43	13.85	2.5975	20	21	48.0	5.022
15	3	45	49.71	2.5979	20	26	44.8	4.873
16	3	48	25.60	2.5983	20	31	32.7	4.724
17	3	51	1.50	2.5985	20	36	11.7	4.574
18	3	53	37.42	2.5988	20	40	41.6	4.423
19	3	56	13.35	2.5988	20	45	2.5	4.273
20	3	58	49.28	2.5988	20	49	14.3	4.122
21	4	1	25.20	2.5986	20	53	17.1	3.971
22	4	4	1.11	2.5983	20	57	10.8	3.820
23	4	6	37.00	2.5980	+21	0	55.5	+3.668
APRIL 4.								
0	4	9	12.87	2.5976	+21	4	31.0	+3.516
1	4	11	48.71	2.5969	21	7	57.4	3.364
2	4	14	24.50	2.5962	21	11	14.7	3.212
3	4	17	0.25	2.5954	21	14	22.8	3.059
4	4	19	35.95	2.5945	21	17	21.8	2.908
5	4	22	11.59	2.5935	21	20	11.7	2.756
6	4	24	47.17	2.5925	21	22	52.5	2.603
7	4	27	22.69	2.5913	21	25	24.1	2.451
8	4	29	58.12	2.5899	21	27	46.6	2.298
9	4	32	33.48	2.5886	21	29	59.9	2.147
10	4	35	8.75	2.5870	21	32	4.2	1.995
11	4	37	43.92	2.5853	21	33	59.3	1.843
12	4	40	18.99	2.5836	21	35	45.3	1.691
13	4	42	53.95	2.5818	21	37	22.2	1.539
14	4	45	28.80	2.5798	21	38	50.0	1.388
15	4	48	3.53	2.5778	21	40	8.8	1.238
16	4	50	38.13	2.5755	21	41	18.6	1.088
17	4	53	12.59	2.5733	21	42	19.3	0.937
18	4	55	46.92	2.5709	21	43	11.0	0.787
19	4	58	21.10	2.5685	21	43	53.7	0.637
20	5	0	55.14	2.5659	21	44	27.4	0.488
21	5	3	29.01	2.5633	21	44	52.2	0.339
22	5	6	2.73	2.5605	21	45	8.1	0.191
23	5	8	36.27	2.5576	21	45	15.1	+0.043
24	5	11	9.64	2.5547	+21	45	13.3	−0.104

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	h	m	s	s	°	′	″	″
APRIL 5.								
0	5	11	9.64	2.5547	+21	45	13.3	−0.104
1	5	13	42.83	2.5516	21	45	2.6	0.251
2	5	16	15.83	2.5484	21	44	43.2	0.397
3	5	18	48.64	2.5452	21	44	15.0	0.543
4	5	21	21.25	2.5418	21	43	38.0	0.688
5	5	23	53.66	2.5384	21	42	52.4	0.833
6	5	26	25.86	2.5349	21	41	58.1	0.976
7	5	28	57.85	2.5313	21	40	55.3	1.119
8	5	31	29.62	2.5277	21	39	43.8	1.262
9	5	34	1.17	2.5239	21	38	23.9	1.403
10	5	36	32.49	2.5200	21	36	55.4	1.545
11	5	39	3.57	2.5161	21	35	18.5	1.685
12	5	41	34.42	2.5122	21	33	33.2	1.824
13	5	44	5.03	2.5080	21	31	39.6	1.963
14	5	46	35.38	2.5038	21	29	37.6	2.102
15	5	49	5.49	2.4997	21	27	27.4	2.238
16	5	51	35.34	2.4953	21	25	9.0	2.374
17	5	54	4.93	2.4910	21	22	42.5	2.509
18	5	56	34.26	2.4865	21	20	7.9	2.644
19	5	59	3.31	2.4819	21	17	25.2	2.778
20	6	1	32.09	2.4774	21	14	34.5	2.910
21	6	4	0.60	2.4728	21	11	36.0	3.042
22	6	6	28.83	2.4681	21	8	29.5	3.173
23	6	8	56.77	2.4633	+21	5	15.2	−3.303
APRIL 6.								
0	6	11	24.43	2.4586	+21	1	53.1	−3.433
1	6	13	51.80	2.4537	20	58	23.3	3.560
2	6	16	18.87	2.4487	20	54	45.9	3.687
3	6	18	45.64	2.4438	20	51	0.9	3.813
4	6	21	12.12	2.4388	20	47	8.3	3.938
5	6	23	38.29	2.4337	20	43	8.3	4.062
6	6	26	4.16	2.4286	20	39	0.9	4.185
7	6	28	29.72	2.4234	20	34	46.1	4.307
8	6	30	54.97	2.4182	20	30	24.1	4.428
9	6	33	19.90	2.4129	20	25	54.8	4.548
10	6	35	44.52	2.4078	20	21	18.3	4.667
11	6	38	8.83	2.4024	20	16	34.8	4.784
12	6	40	32.81	2.3970	20	11	44.2	4.901
13	6	42	56.47	2.3917	20	6	46.7	5.016
14	6	45	19.81	2.3863	20	1	42.3	5.131
15	6	47	42.82	2.3808	19	56	31.0	5.244
16	6	50	5.51	2.3754	19	51	13.0	5.356
17	6	52	27.87	2.3698	19	45	48.3	5.468
18	6	54	49.89	2.3643	19	40	16.9	5.578
19	6	57	11.59	2.3588	19	34	39.0	5.686
20	6	59	32.95	2.3533	19	28	54.6	5.793
21	7	1	53.98	2.3478	19	23	3.8	5.900
22	7	4	14.68	2.3422	19	17	6.6	6.007
23	7	6	35.04	2.3365	19	11	3.0	6.111
24	7	8	55.06	2.3309	+19	4	53.3	−6.213

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
		APRIL 7.		
	h m s	s	° ′ ″	″
0	7 8 55.06	2.3309	+19 4 53.3	−6.213
1	7 11 14.75	2.3253	18 58 37.4	6.316
2	7 13 34.10	2.3197	18 52 15.4	6.417
3	7 15 53.11	2.3140	18 45 47.4	6.517
4	7 18 11.78	2.3084	18 39 13.4	6.615
5	7 20 30.12	2.3028	18 32 33.6	6.713
6	7 22 48.11	2.2971	18 25 47.9	6.809
7	7 25 5.77	2.2915	18 18 56.5	6.904
8	7 27 23.09	2.2859	18 11 59.4	6.999
9	7 29 40.08	2.2803	18 4 56.6	7.092
10	7 31 56.72	2.2746	17 57 48.4	7.183
11	7 34 13.03	2.2690	17 50 34.6	7.275
12	7 36 29.00	2.2633	17 43 15.4	7.364
13	7 38 44.63	2.2578	17 35 50.9	7.453
14	7 40 59.93	2.2523	17 28 21.1	7.540
15	7 43 14.90	2.2467	17 20 46.1	7.626
16	7 45 29.53	2.2411	17 13 6.0	7.711
17	7 47 43.83	2.2355	17 5 20.8	7.795
18	7 49 57.79	2.2299	16 57 30.6	7.878
19	7 52 11.42	2.2245	16 49 35.5	7.959
20	7 54 24.73	2.2190	16 41 35.5	8.040
21	7 56 37.70	2.2135	16 33 30.7	8.120
22	7 58 50.35	2.2081	16 25 21.1	8.198
23	8 1 2.67	2.2026	+16 17 6.9	−8.275
		APRIL 8.		
0	8 3 14.66	2.1972	+16 8 48.1	−8.351
1	8 5 26.33	2.1918	16 0 24.8	8.426
2	8 7 37.68	2.1865	15 51 57.0	8.500
3	8 9 48.71	2.1812	15 43 24.8	8.573
4	8 11 59.42	2.1759	15 34 48.3	8.645
5	8 14 9.82	2.1707	15 26 7.4	8.716
6	8 16 19.90	2.1653	15 17 22.4	8.785
7	8 18 29.66	2.1602	15 8 33.2	8.853
8	8 20 39.12	2.1550	14 59 40.0	8.921
9	8 22 48.26	2.1498	14 50 42.7	8.988
10	8 24 57.10	2.1448	14 41 41.5	9.053
11	8 27 5.63	2.1397	14 32 36.4	9.118
12	8 29 13.86	2.1347	14 23 27.4	9.181
13	8 31 21.79	2.1297	14 14 14.7	9.243
14	8 33 29.42	2.1247	14 4 58.3	9.303
15	8 35 36.75	2.1197	13 55 38.3	9.363
16	8 37 43.78	2.1148	13 46 14.7	9.423
17	8 39 50.53	2.1101	13 36 47.6	9.481
18	8 41 56.99	2.1053	13 27 17.0	9.538
19	8 44 3.16	2.1004	13 17 43.0	9.594
20	8 46 9.04	2.0958	13 8 5.7	9.648
21	8 48 14.65	2.0912	12 58 25.2	9.703
22	8 50 19.98	2.0865	12 48 41.4	9.757
23	8 52 25.03	2.0818	12 38 54.4	9.808
24	8 54 29.80	2.0773	+12 29 4.4	−9.859

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
		APRIL 9.		
	h m s	s	° ′ ″	″
0	8 54 29.80	2.0773	+12 29 4.4	− 9.859
1	8 56 34.30	2.0728	12 19 11.3	9.909
2	8 58 38.54	2.0684	12 9 15.3	9.958
3	9 0 42.51	2.0639	11 59 16.4	10.006
4	9 2 46.21	2.0596	11 49 14.6	10.053
5	9 4 49.66	2.0553	11 39 10.0	10.099
6	9 6 52.85	2.0510	11 29 2.7	10.145
7	9 8 55.78	2.0468	11 18 52.6	10.189
8	9 10 58.47	2.0427	11 8 40.0	10.232
9	9 13 0.90	2.0385	10 58 24.8	10.275
10	9 15 3.09	2.0345	10 48 7.0	10.317
11	9 17 5.04	2.0305	10 37 46.8	10.357
12	9 19 6.75	2.0265	10 27 24.2	10.396
13	9 21 8.22	2.0226	10 16 59.3	10.435
14	9 23 9.46	2.0188	10 6 32.0	10.473
15	9 25 10.47	2.0149	9 56 2.5	10.510
16	9 27 11.25	2.0111	9 45 30.8	10.546
17	9 29 11.80	2.0073	9 34 57.0	10.581
18	9 31 12.13	2.0038	9 24 21.1	10.615
19	9 33 12.25	2.0002	9 13 43.2	10.648
20	9 35 12.15	1.9966	9 3 3.3	10.681
21	9 37 11.84	1.9931	8 52 21.5	10.713
22	9 39 11.32	1.9897	8 41 37.8	10.743
23	9 41 10.60	1.9863	+ 8 30 52.3	−10.773
		APRIL 10.		
0	9 43 9.67	1.9828	+ 8 20 5.0	−10.803
1	9 45 8.54	1.9796	8 9 16.0	10.830
2	9 47 7.22	1.9764	7 58 25.4	10.858
3	9 49 5.71	1.9732	7 47 33.1	10.884
4	9 51 4.00	1.9700	7 36 39.3	10.909
5	9 53 2.11	1.9670	7 25 44.0	10.934
6	9 55 0.04	1.9639	7 14 47.2	10.958
7	9 56 57.78	1.9609	7 3 49.0	10.982
8	9 58 55.35	1.9581	6 52 49.4	11.004
9	10 0 52.75	1.9552	6 41 48.5	11.025
10	10 2 49.97	1.9523	6 30 46.4	11.046
11	10 4 47.03	1.9496	6 19 43.0	11.066
12	10 6 43.92	1.9468	6 8 38.5	11.084
13	10 8 40.65	1.9443	5 57 32.9	11.103
14	10 10 37.23	1.9417	5 46 26.2	11.120
15	10 12 33.65	1.9391	5 35 18.5	11.137
16	10 14 29.92	1.9366	5 24 9.8	11.153
17	10 16 26.04	1.9342	5 13 0.1	11.168
18	10 18 22.02	1.9318	5 1 49.6	11.182
19	10 20 17.86	1.9295	4 50 38.3	11.195
20	10 22 13.56	1.9272	4 39 26.2	11.208
21	10 24 9.12	1.9250	4 28 13.3	11.221
22	10 26 4.56	1.9228	4 16 59.7	11.232
23	10 27 59.86	1.9207	4 5 45.5	11.242
24	10 29 55.04	1.9187	+ 3 54 30.7	−11.252

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 11.					APRIL 13.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 29 55.04	1.9187	+3 54 30.7	−11.252	0	12 0 37.98	1.8802	− 5 2 47.8	−10.867
1	10 31 50.10	1.9167	3 43 15.3	11.260	1	12 2 30.80	1.8806	5 13 39.0	10.841
2	10 33 45.04	1.9147	3 31 59.5	11.268	2	12 4 23.65	1.8810	5 24 28.7	10.815
3	10 35 39.86	1.9128	3 20 43.1	11.277	3	12 6 16.52	1.8814	5 35 16.8	10.788
4	10 37 34.58	1.9110	3 9 26.3	11.283	4	12 8 9.42	1.8819	5 46 3.3	10.761
5	10 39 29.18	1.9092	2 58 9.2	11.288	5	12 10 2.35	1.8825	5 56 48.1	10.733
6	10 41 23.68	1.9075	2 46 51.7	11.293	6	12 11 55.32	1.8831	6 7 31.3	10.706
7	10 43 18.08	1.9058	2 35 34.0	11.298	7	12 13 48.32	1.8837	6 18 12.8	10.677
8	10 45 12.38	1.9042	2 24 16.0	11.302	8	12 15 41.36	1.8843	6 28 52.5	10.647
9	10 47 6.58	1.9026	2 12 57.8	11.305	9	12 17 34.44	1.8851	6 39 30.4	10.617
10	10 49 0.69	1.9011	2 1 39.4	11.307	10	12 19 27.57	1.8858	6 50 6.5	10.585
11	10 50 54.71	1.8996	1 50 21.0	11.308	11	12 21 20.74	1.8866	7 0 40.6	10.553
12	10 52 48.64	1.8982	1 39 2.5	11.308	12	12 23 13.96	1.8874	7 11 12.9	10.522
13	10 54 42.49	1.8968	1 27 44.0	11.308	13	12 25 7.23	1.8883	7 21 43.2	10.488
14	10 56 36.26	1.8955	1 16 25.5	11.308	14	12 27 0.55	1.8892	7 32 11.5	10.455
15	10 58 29.95	1.8942	1 5 7.0	11.307	15	12 28 53.93	1.8901	7 42 37.8	10.421
16	11 0 23.56	1.8930	0 53 48.7	11.304	16	12 30 47.36	1.8911	7 53 2.0	10.385
17	11 2 17.11	1.8919	0 42 30.5	11.302	17	12 32 40.86	1.8921	8 3 24.0	10.349
18	11 4 10.59	1.8908	0 31 12.5	11.298	18	12 34 34.41	1.8931	8 13 43.9	10.313
19	11 6 4.00	1.8897	0 19 54.8	11.293	19	12 36 28.03	1.8943	8 24 1.6	10.277
20	11 7 57.35	1.8887	+0 8 37.3	11.288	20	12 38 21.72	1.8953	8 34 17.1	10.239
21	11 9 50.64	1.8877	−0 2 39.8	11.283	21	12 40 15.47	1.8965	8 44 30.3	10.200
22	11 11 43.87	1.8868	0 13 56.6	11.277	22	12 42 9.30	1.8978	8 54 41.1	10.161
23	11 13 37.05	1.8859	−0 25 13.0	−11.269	23	12 44 3.20	1.8989	− 9 4 49.6	−10.122
	APRIL 12.					APRIL 14.			
0	11 15 30.18	1.8852	−0 36 28.9	−11.261	0	12 45 57.17	1.9002	− 9 14 55.7	−10.082
1	11 17 23.27	1.8844	0 47 44.3	11.253	1	12 47 51.22	1.9015	9 24 59.4	10.041
2	11 19 16.31	1.8837	0 58 59.2	11.244	2	12 49 45.35	1.9028	9 35 0.6	9.998
3	11 21 9.31	1.8830	1 10 13.6	11.234	3	12 51 39.56	1.9043	9 44 59.2	9.956
4	11 23 2.27	1.8824	1 21 27.3	11.223	4	12 53 33.86	1.9057	9 54 55.3	9.913
5	11 24 55.20	1.8818	1 32 40.3	11.211	5	12 55 28.24	1.9070	10 4 48.8	9.870
6	11 26 48.09	1.8813	1 43 52.6	11.199	6	12 57 22.70	1.9085	10 14 39.7	9.826
7	11 28 40.96	1.8809	1 55 4.2	11.187	7	12 59 17.26	1.9101	10 24 27.9	9.781
8	11 30 33.80	1.8805	2 6 15.0	11.173	8	13 1 11.91	1.9116	10 34 13.4	9.736
9	11 32 26.62	1.8802	2 17 25.0	11.160	9	13 3 6.65	1.9131	10 43 56.2	9.690
10	11 34 19.42	1.8798	2 28 34.2	11.145	10	13 5 1.48	1.9147	10 53 36.2	9.643
11	11 36 12.20	1.8795	2 39 42.4	11.128	11	13 6 56.41	1.9163	11 3 13.3	9.594
12	11 38 4.96	1.8793	2 50 49.6	11.113	12	13 8 51.44	1.9180	11 12 47.5	9.546
13	11 39 57.71	1.8792	3 1 55.9	11.096	13	13 10 46.57	1.9197	11 22 18.8	9.498
14	11 41 50.46	1.8790	3 13 1.1	11.078	14	13 12 41.80	1.9213	11 31 47.2	9.448
15	11 43 43.19	1.8788	3 24 5.3	11.061	15	13 14 37.13	1.9231	11 41 12.6	9.398
16	11 45 35.92	1.8788	3 35 8.4	11.042	16	13 16 32.57	1.9248	11 50 35.0	9.348
17	11 47 28.65	1.8789	3 46 10.3	11.022	17	13 18 28.11	1.9267	11 59 54.4	9.297
18	11 49 21.39	1.8790	3 57 11.0	11.002	18	13 20 23.77	1.9285	12 9 10.6	9.244
19	11 51 14.13	1.8790	4 8 10.5	10.981	19	13 22 19.53	1.9303	12 18 23.7	9.192
20	11 53 6.87	1.8791	4 19 8.7	10.958	20	13 24 15.40	1.9322	12 27 33.6	9.138
21	11 54 59.62	1.8793	4 30 5.5	10.936	21	13 26 11.39	1.9341	12 30 40.3	9.085
22	11 56 52.39	1.8797	4 41 1.0	10.913	22	13 28 7.49	1.9360	12 45 43.8	9.030
23	11 58 45.18	1.8799	4 51 55.0	10.890	23	13 30 3.71	1.9380	12 54 43.9	8.974
24	12 0 37.98	1.8802	−5 2 47.8	−10.867	24	13 32 0.05	1.9399	−13 3 40.7	− 8.918

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 15.					APRIL 17.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 32 0.05	1.9399	−13 3 40.7	−8.918	0	15 7 40.27	2.0492	−18 55 39.6	−5.521
1	13 33 56.50	1.9418	13 12 34.1	8.862	1	15 9 43.29	2.0515	19 1 8.3	5.436
2	13 35 53.07	1.9439	13 21 24.1	8.805	2	15 11 46.45	2.0538	19 6 31.9	5.350
3	13 37 49.77	1.9459	13 30 10.7	8.748	3	15 13 49.75	2.0562	19 11 50.3	5.265
4	13 39 46.58	1.9479	13 38 53.8	8.689	4	15 15 53.19	2.0585	19 17 3.7	5.179
5	13 41 43.52	1.9501	13 47 33.4	8.630	5	15 17 56.77	2.0608	19 22 11.8	5.092
6	13 43 40.59	1.9522	13 56 9.4	8.570	6	15 20 0.48	2.0630	19 27 14.7	5.005
7	13 45 37.78	1.9543	14 4 41.8	8.510	7	15 22 4.33	2.0653	19 32 12.4	4.917
8	13 47 35.10	1.9563	14 13 10.6	8.448	8	15 24 8.31	2.0675	19 37 4.7	4.828
9	13 49 32.54	1.9585	14 21 35.6	8.387	9	15 26 12.43	2.0698	19 41 51.8	4.741
10	13 51 30.12	1.9607	14 29 57.0	8.326	10	15 28 16.68	2.0719	19 46 33.6	4.652
11	13 53 27.82	1.9628	14 38 14.7	8.263	11	15 30 21.06	2.0742	19 51 10.0	4.562
12	13 55 25.66	1.9651	14 46 28.5	8.198	12	15 32 25.58	2.0764	19 55 41.0	4.472
13	13 57 23.63	1.9673	14 54 38.5	8.135	13	15 34 30.23	2.0785	20 0 6.6	4.382
14	13 59 21.73	1.9695	15 2 44.7	8.070	14	15 36 35.00	2.0806	20 4 26.8	4.291
15	14 1 19.97	1.9718	15 10 46.9	8.004	15	15 38 39.90	2.0828	20 8 41.5	4.199
16	14 3 18.34	1.9739	15 18 45.2	7.939	16	15 40 44.93	2.0849	20 12 50.7	4.108
17	14 5 16.84	1.9762	15 26 39.6	7.873	17	15 42 50.09	2.0870	20 16 54.4	4.015
18	14 7 15.48	1.9785	15 34 29.9	7.805	18	15 44 55.37	2.0890	20 20 52.5	3.923
19	14 9 14.26	1.9808	15 42 16.2	7.738	19	15 47 0.77	2.0911	20 24 45.1	3.830
20	14 11 13.18	1.9831	15 49 58.4	7.669	20	15 49 6.30	2.0932	20 28 32.1	3.737
21	14 13 12.23	1.9854	15 57 36.5	7.600	21	15 51 11.95	2.0952	20 32 13.5	3.643
22	14 15 11.43	1.9878	16 5 10.4	7.531	22	15 53 17.72	2.0972	20 35 49.2	3.548
23	14 17 10.77	1.9901	−16 12 40.2	−7.461	23	15 55 23.61	2.0991	−20 39 19.3	−3.454
	APRIL 16.					APRIL 18.			
0	14 19 10.24	1.9923	−16 20 5.7	−7.390	0	15 57 29.61	2.1010	−20 42 43.7	−3.359
1	14 21 9.85	1.9948	16 27 27.0	7.318	1	15 59 35.73	2.1030	20 46 2.4	3.263
2	14 23 9.61	1.9972	16 34 43.9	7.246	2	16 1 41.97	2.1048	20 49 15.3	3.168
3	14 25 9.51	1.9995	16 41 56.5	7.174	3	16 3 48.31	2.1067	20 52 22.5	3.071
4	14 27 9.55	2.0018	16 49 4.8	7.101	4	16 5 54.77	2.1086	20 55 23.8	2.974
5	14 29 9.73	2.0042	16 56 8.6	7.027	5	16 8 1.34	2.1104	20 58 19.4	2.878
6	14 31 10.05	2.0065	17 3 8.0	6.953	6	16 10 8.02	2.1123	21 1 9.2	2.781
7	14 33 10.51	2.0089	17 10 3.0	6.878	7	16 12 14.81	2.1139	21 3 53.1	2.683
8	14 35 11.12	2.0114	17 16 53.4	6.803	8	16 14 21.69	2.1157	21 6 31.2	2.586
9	14 37 11.88	2.0138	17 23 39.3	6.727	9	16 16 28.69	2.1174	21 9 3.4	2.487
10	14 39 12.77	2.0161	17 30 20.6	6.650	10	16 18 35.78	2.1191	21 11 29.6	2.388
11	14 41 13.81	2.0185	17 36 57.3	6.573	11	16 20 42.98	2.1208	21 13 50.0	2.290
12	14 43 14.99	2.0209	17 43 29.3	6.495	12	16 22 50.27	2.1223	21 16 4.4	2.191
13	14 45 16.32	2.0233	17 49 56.7	6.417	13	16 24 57.66	2.1240	21 18 12.9	2.091
14	14 47 17.78	2.0256	17 56 19.3	6.338	14	16 27 5.15	2.1256	21 20 15.3	1.991
15	14 49 19.39	2.0280	18 2 37.2	6.259	15	16 29 12.73	2.1271	21 22 11.8	1.892
16	14 51 21.14	2.0303	18 8 50.4	6.179	16	16 31 20.40	2.1286	21 24 2.3	1.791
17	14 53 23.03	2.0328	18 14 58.7	6.098	17	16 33 28.16	2.1301	21 25 46.7	1.690
18	14 55 25.07	2.0352	18 21 2.2	6.018	18	16 35 36.01	2.1315	21 27 25.1	1.590
19	14 57 27.25	2.0375	18 27 0.8	5.936	19	16 37 43.94	2.1329	21 28 57.5	1.489
20	14 59 29.57	2.0399	18 32 54.5	5.853	20	16 39 51.96	2.1343	21 30 23.8	1.388
21	15 1 32.04	2.0423	18 38 43.2	5.771	21	16 42 0.06	2.1357	21 31 44.0	1.285
22	15 3 34.64	2.0446	18 44 27.0	5.688	22	16 44 8.24	2.1370	21 32 58.0	1.183
23	15 5 37.39	2.0469	18 50 5.8	5.605	23	16 46 16.50	2.1383	21 34 6.0	1.083
24	15 7 40.27	2.0492	−18 55 39.6	−5.521	24	16 48 24.84	2.1396	−21 35 7.9	−0.980

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 19.			
	h m s	s	° ′ ″	″
0	16 48 24.84	2.1396	−21 35 7.9	−0.980
1	16 50 33.25	2.1408	21 36 3.6	0.878
2	16 52 41.74	2.1420	21 36 53.2	0.775
3	16 54 50.29	2.1432	21 37 36.6	0.673
4	16 56 58.92	2.1443	21 38 13.9	0.569
5	16 59 7.61	2.1453	21 38 44.9	0.465
6	17 1 16.36	2.1464	21 39 9.7	0.363
7	17 3 25.18	2.1475	21 39 28.4	0.259
8	17 5 34.06	2.1485	21 39 40.8	0.155
9	17 7 43.00	2.1494	21 39 47.0	−0.052
10	17 9 51.99	2.1504	21 39 47.0	+0.053
11	17 12 1.05	2.1513	21 39 40.7	0.158
12	17 14 10.15	2.1522	21 39 28.1	0.262
13	17 16 19.31	2.1530	21 39 9.3	0.365
14	17 18 28.51	2.1538	21 38 44.3	0.469
15	17 20 37.76	2.1546	21 38 13.0	0.574
16	17 22 47.06	2.1553	21 37 35.4	0.679
17	17 24 56.40	2.1560	21 36 51.5	0.784
18	17 27 5.78	2.1567	21 36 1.3	0.888
19	17 29 15.20	2.1573	21 35 4.9	0.993
20	17 31 24.65	2.1578	21 34 2.2	1.098
21	17 33 34.14	2.1585	21 32 53.1	1.203
22	17 35 43.67	2.1591	21 31 37.8	1.308
23	17 37 53.23	2.1595	−21 30 16.2	+1.413
	APRIL 20.			
0	17 40 2.81	2.1599	−21 28 48.2	+1.518
1	17 42 12.42	2.1604	21 27 14.0	1.623
2	17 44 22.06	2.1609	21 25 33.4	1.728
3	17 46 31.73	2.1613	21 23 46.6	1.833
4	17 48 41.41	2.1616	21 21 53.4	1.938
5	17 50 51.12	2.1619	21 19 54.0	2.043
6	17 53 0.84	2.1622	21 17 48.2	2.148
7	17 55 10.58	2.1625	21 15 36.2	2.253
8	17 57 20.34	2.1628	21 13 17.8	2.359
9	17 59 30.11	2.1628	21 10 53.1	2.463
10	18 1 39.88	2.1630	21 8 22.2	2.568
11	18 3 49.67	2.1633	21 5 44.9	2.673
12	18 5 59.47	2.1633	21 3 1.4	2.778
13	18 8 9.27	2.1634	21 0 11.6	2.883
14	18 10 19.08	2.1635	20 57 15.5	2.987
15	18 12 28.89	2.1635	20 54 13.2	3.091
16	18 14 38.70	2.1635	20 51 4.6	3.196
17	18 16 48.51	2.1635	20 47 49.7	3.300
18	18 18 58.32	2.1635	20 44 28.6	3.403
19	18 21 8.13	2.1634	20 41 1.3	3.508
20	18 23 17.93	2.1633	20 37 27.7	3.612
21	18 25 27.73	2.1633	20 33 47.9	3.716
22	18 27 37.52	2.1631	20 30 1.8	3.819
23	18 29 47.30	2.1629	20 26 9.6	3.923
24	18 31 57.07	2.1628	−20 22 11.1	+4.026

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 21.			
	h m s	s	° ′ ″	″
0	18 31 57.07	2.1628	−20 22 11.1	+4.026
1	18 34 6.83	2.1626	20 18 6.5	4.128
2	18 36 16.58	2.1623	20 13 55.7	4.232
3	18 38 26.31	2.1621	20 9 38.7	4.334
4	18 40 36.03	2.1618	20 5 15.6	4.437
5	18 42 45.73	2.1616	20 0 46.3	4.539
6	18 44 55.42	2.1613	19 56 10.9	4.641
7	18 47 5.09	2.1610	19 51 29.4	4.743
8	18 49 14.74	2.1607	19 46 41.7	4.845
9	18 51 24.37	2.1603	19 41 48.0	4.946
10	18 53 33.97	2.1599	19 36 48.2	5.048
11	18 55 43.56	2.1596	19 31 42.3	5.148
12	18 57 53.12	2.1592	19 26 30.4	5.248
13	19 0 2.66	2.1588	19 21 12.5	5.349
14	19 2 12.17	2.1583	19 15 48.5	5.450
15	19 4 21.66	2.1579	19 10 18.5	5.549
16	19 6 31.12	2.1575	19 4 42.6	5.648
17	19 8 40.56	2.1570	18 59 0.7	5.748
18	19 10 49.96	2.1565	18 53 12.8	5.848
19	19 12 59.34	2.1562	18 47 19.0	5.946
20	19 15 8.70	2.1557	18 41 19.3	6.044
21	19 17 18.02	2.1552	18 35 13.7	6.143
22	19 19 27.32	2.1548	18 29 2.2	6.240
23	19 21 36.59	2.1543	−18 22 44.9	+6.338
	APRIL 22.			
0	19 23 45.83	2.1538	−18 16 21.7	+6.435
1	19 25 55.04	2.1533	18 9 52.7	6.532
2	19 28 4.22	2.1528	18 3 17.9	6.628
3	19 30 13.37	2.1523	17 56 37.4	6.723
4	19 32 22.49	2.1518	17 49 51.1	6.819
5	19 34 31.58	2.1512	17 42 59.1	6.915
6	19 36 40.63	2.1507	17 36 1.3	7.010
7	19 38 49.66	2.1503	17 28 57.9	7.104
8	19 40 58.66	2.1498	17 21 48.8	7.198
9	19 43 7.63	2.1493	17 14 34.1	7.292
10	19 45 16.57	2.1488	17 7 13.8	7.385
11	19 47 25.49	2.1483	16 59 47.9	7.478
12	19 49 34.37	2.1478	16 52 16.4	7.571
13	19 51 43.22	2.1473	16 44 39.4	7.663
14	19 53 52.04	2.1468	16 36 56.8	7.755
15	19 56 0.84	2.1463	16 29 8.8	7.846
16	19 58 9.60	2.1458	16 21 15.3	7.937
17	20 0 18.34	2.1455	16 13 16.4	8.027
18	20 2 27.06	2.1450	16 5 12.1	8.117
19	20 4 35.74	2.1445	15 57 2.4	8.206
20	20 6 44.40	2.1442	15 48 47.4	8.295
21	20 8 53.04	2.1438	15 40 27.0	8.384
22	20 11 1.65	2.1433	15 32 1.3	8.472
23	20 13 10.24	2.1430	15 23 30.4	8.558
24	20 15 18.81	2.1427	−15 14 54.3	+8.643

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 23.					APRIL 25.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 15 18.81	2.1427	−15 14 54.3	+ 8.645	0	21 58 12.54	2.1575	−6 51 7.7	+12.077
1	20 17 27.36	2.1423	15 6 13.0	8.732	1	22 0 22.03	2.1588	6 39 1.5	12.130
2	20 19 35.89	2.1419	14 57 26.5	8.818	2	22 2 31.59	2.1600	6 26 52.1	12.182
3	20 21 44.39	2.1416	14 48 34.8	8.903	3	22 4 41.23	2.1613	6 14 39.7	12.232
4	20 23 52.88	2.1413	14 39 38.1	8.988	4	22 6 50.95	2.1628	6 2 24.3	12.282
5	20 26 1.35	2.1411	14 30 36.2	9.073	5	22 9 0.76	2.1642	5 50 5.9	12.331
6	20 28 9.81	2.1408	14 21 29.4	9.156	6	22 11 10.65	2.1657	5 37 44.6	12.378
7	20 30 18.25	2.1406	14 12 17.5	9.239	7	22 13 20.64	2.1673	5 25 20.5	12.425
8	20 32 26.68	2.1404	14 3 0.7	9.322	8	22 15 30.72	2.1688	5 12 53.6	12.471
9	20 34 35.10	2.1402	13 53 38.9	9.404	9	22 17 40.90	2.1704	5 0 24.0	12.516
10	20 36 43.50	2.1399	13 44 12.2	9.486	10	22 19 51.17	2.1721	4 47 51.7	12.559
11	20 38 51.89	2.1398	13 34 40.6	9.567	11	22 22 1.55	2.1739	4 35 16.9	12.602
12	20 41 0.28	2.1398	13 25 4.2	9.647	12	22 24 12.04	2.1758	4 22 39.5	12.644
13	20 43 8.66	2.1397	13 15 23.0	9.726	13	22 26 22.64	2.1775	4 9 59.6	12.684
14	20 45 17.04	2.1396	13 5 37.1	9.805	14	22 28 33.34	2.1794	3 57 17.4	12.723
15	20 47 25.41	2.1395	12 55 46.4	9.884	15	22 30 44.17	2.1814	3 44 32.8	12.763
16	20 49 33.78	2.1395	12 45 51.0	9.963	16	22 32 55.11	2.1833	3 31 45.9	12.800
17	20 51 42.15	2.1395	12 35 50.9	10.039	17	22 35 6.17	2.1854	3 18 56.8	12.837
18	20 53 50.52	2.1396	12 25 46.3	10.116	18	22 37 17.36	2.1876	3 6 5.5	12.872
19	20 55 58.90	2.1397	12 15 37.0	10.193	19	22 39 28.68	2.1898	2 53 12.2	12.905
20	20 58 7.28	2.1397	12 5 23.2	10.268	20	22 41 40.13	2.1920	2 40 16.9	12.938
21	21 0 15.66	2.1398	11 55 4.9	10.342	21	22 43 51.72	2.1943	2 27 19.7	12.970
22	21 2 24.06	2.1400	11 44 42.2	10.416	22	22 46 3.44	2.1965	2 14 20.5	13.001
23	21 4 32.46	2.1402	−11 34 15.0	+10.489	23	22 48 15.30	2.1989	−2 1 19.6	+13.030
	APRIL 24.					APRIL 26.			
0	21 6 40.88	2.1404	−11 23 43.5	+10.562	0	22 50 27.31	2.2013	−1 48 16.9	+13.058
1	21 8 49.31	2.1408	11 13 7.6	10.634	1	22 52 39.46	2.2038	1 35 12.6	13.085
2	21 10 57.77	2.1411	11 2 27.4	10.705	2	22 54 51.77	2.2063	1 22 6.7	13.110
3	21 13 6.24	2.1413	10 51 43.0	10.776	3	22 57 4.22	2.2089	1 8 59.4	13.134
4	21 15 14.73	2.1417	10 40 54.3	10.846	4	22 59 16.84	2.2117	0 55 50.6	13.158
5	21 17 23.24	2.1421	10 30 1.5	10.915	5	23 1 29.62	2.2143	0 42 40.4	13.180
6	21 19 31.78	2.1426	10 19 4.5	10.983	6	23 3 42.55	2.2170	0 29 29.0	13.200
7	21 21 40.35	2.1431	10 8 3.5	11.051	7	23 5 55.66	2.2199	0 16 16.4	13.220
8	21 23 48.95	2.1436	9 56 58.4	11.118	8	23 8 8.94	2.2228	−0 3 2.6	13.238
9	21 25 57.58	2.1441	9 45 49.4	11.183	9	23 10 22.39	2.2256	+0 10 12.2	13.255
10	21 28 6.24	2.1447	9 34 36.4	11.249	10	23 12 36.01	2.2286	0 23 28.0	13.270
11	21 30 14.94	2.1453	9 23 19.5	11.313	11	23 14 49.82	2.2317	0 36 44.6	13.284
12	21 32 23.68	2.1460	9 11 58.8	11.377	12	23 17 3.81	2.2348	0 50 2.1	13.297
13	21 34 32.46	2.1468	9 0 34.3	11.440	13	23 19 17.99	2.2378	1 3 20.3	13.308
14	21 36 41.29	2.1475	8 49 6.0	11.503	14	23 21 32.35	2.2410	1 16 39.1	13.318
15	21 38 50.16	2.1483	8 37 34.0	11.563	15	23 23 46.91	2.2443	1 29 58.5	13.327
16	21 40 59.08	2.1491	8 25 58.4	11.624	16	23 26 1.67	2.2476	1 43 18.3	13.334
17	21 43 8.05	2.1500	8 14 19.1	11.684	17	23 28 16.62	2.2508	1 56 38.6	13.340
18	21 45 17.08	2.1509	8 2 36.3	11.743	18	23 30 31.77	2.2543	2 9 59.1	13.344
19	21 47 26.16	2.1519	7 50 50.0	11.801	19	23 32 47.13	2.2578	2 23 19.9	13.347
20	21 49 35.31	2.1530	7 39 0.2	11.858	20	23 35 2.70	2.2613	2 36 40.8	13.348
21	21 51 44.52	2.1540	7 27 7.1	11.913	21	23 37 18.48	2.2648	2 50 1.7	13.348
22	21 53 53.79	2.1551	7 15 10.6	11.970	22	23 39 34.47	2.2683	3 3 22.5	13.347
23	21 56 3.13	2.1563	7 3 10.7	12.024	23	23 41 50.68	2.2720	3 16 43.3	13.344
24	21 58 12.54	2.1575	− 6 51 7.7	+12.077	24	23 44 7.11	2.2757	+3 30 3.8	+13.339

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 27.					APRIL 29.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 44 7.11	2.2757	+ 3 30 3.8	+13.339	0	1 38 22.10	2.4946	+13 33 38.9	+11.138
1	23 46 23.76	2.2794	3 43 24.0	13.333	1	1 40 51.92	2.4994	13 44 44.5	11.048
2	23 48 40.64	2.2833	3 56 43.8	13.325	2	1 43 22.03	2.5043	13 55 44.7	10.957
3	23 50 57.75	2.2871	4 10 3.0	13.316	3	1 45 52.43	2.5091	14 6 39.3	10.863
4	23 53 15.09	2.2910	4 23 21.7	13.305	4	1 48 23.12	2.5139	14 17 28.3	10.769
5	23 55 32.67	2.2949	4 36 39.6	13.293	5	1 50 54.10	2.5187	14 28 11.6	10.672
6	23 57 50.48	2.2989	4 49 56.8	13.279	6	1 53 25.36	2.5234	14 38 48.9	10.573
7	0 0 8.54	2.3030	5 3 13.1	13.263	7	1 55 56.91	2.5282	14 49 20.4	10.474
8	0 2 26.84	2.3070	5 16 28.4	13.247	8	1 58 28.74	2.5328	14 59 45.8	10.372
9	0 4 45.38	2.3111	5 29 42.7	13.228	9	2 1 0.85	2.5375	15 10 5.0	10.268
10	0 7 4.17	2.3153	5 42 55.7	13.207	10	2 3 33.24	2.5422	15 20 17.9	10.163
11	0 9 23.21	2.3195	5 56 7.5	13.185	11	2 6 5.91	2.5468	15 30 24.5	10.056
12	0 11 42.51	2.3238	6 9 17.9	13.161	12	2 8 38.85	2.5513	15 40 24.6	9.947
13	0 14 2.06	2.3280	6 22 26.8	13.136	13	2 11 12.06	2.5558	15 50 18.1	9.837
14	0 16 21.87	2.3323	6 35 34.2	13.109	14	2 13 45.55	2.5603	16 0 5.0	9.725
15	0 18 41.94	2.3368	6 48 39.9	13.080	15	2 16 19.30	2.5647	16 9 45.1	9.611
16	0 21 2.28	2.3412	7 1 43.8	13.050	16	2 18 53.31	2.5690	16 19 18.3	9.496
17	0 23 22.88	2.3456	7 14 45.9	13.018	17	2 21 27.58	2.5733	16 28 44.6	9.379
18	0 25 43.75	2.3501	7 27 45.9	12.983	18	2 24 2.11	2.5776	16 38 3.8	9.260
19	0 28 4.89	2.3546	7 40 43.8	12.948	19	2 26 36.89	2.5818	16 47 15.8	9.140
20	0 30 26.30	2.3592	7 53 39.6	12.911	20	2 29 11.92	2.5858	16 56 20.6	9.019
21	0 32 47.99	2.3638	8 6 33.1	12.872	21	2 31 47.19	2.5899	17 5 18.1	8.896
22	0 35 9.95	2.3683	8 19 24.2	12.830	22	2 34 22.71	2.5939	17 14 8.1	8.771
23	0 37 32.19	2.3730	+ 8 32 12.7	+12.788	23	2 36 58.46	2.5978	+17 22 50.6	+ 8.645
	APRIL 28.					APRIL 30.			
0	0 39 54.71	2.3777	+ 8 44 58.7	+12.743	0	2 39 34.45	2.6018	+17 31 25.5	+ 8.518
1	0 42 17.51	2.3823	8 57 41.9	12.697	1	2 42 10.67	2.6055	17 39 52.7	8.389
2	0 44 40.59	2.3871	9 10 22.3	12.649	2	2 44 47.11	2.6093	17 48 12.2	8.259
3	0 47 3.96	2.3918	9 22 59.8	12.600	3	2 47 23.78	2.6129	17 56 23.8	8.127
4	0 49 27.61	2.3966	9 35 34.3	12.548	4	2 50 0.66	2.6164	18 4 27.4	7.993
5	0 51 51.55	2.4014	9 48 5.6	12.495	5	2 52 37.75	2.6198	18 12 23.0	7.859
6	0 54 15.78	2.4063	10 0 33.7	12.440	6	2 55 15.04	2.6232	18 20 10.5	7.723
7	0 56 40.30	2.4111	10 12 58.4	12.383	7	2 57 52.53	2.6265	18 27 49.8	7.586
8	0 59 5.11	2.4159	10 25 19.6	12.323	8	3 0 30.22	2.6298	18 35 20.8	7.443
9	1 1 30.21	2.4208	10 37 37.2	12.263	9	3 3 8.10	2.6328	18 42 43.5	7.300
10	1 3 55.60	2.4257	10 49 51.2	12.202	10	3 5 46.16	2.6358	18 49 57.9	7.168
11	1 6 21.29	2.4306	11 2 1.4	12.138	11	3 8 24.39	2.6387	18 57 3.7	7.026
12	1 8 47.27	2.4355	11 14 7.7	12.072	12	3 11 2.80	2.6415	19 4 1.0	6.883
13	1 11 13.55	2.4404	11 26 10.0	12.003	13	3 13 41.37	2.6443	19 10 49.7	6.739
14	1 13 40.12	2.4453	11 38 8.1	11.933	14	3 16 20.11	2.6469	19 17 29.7	6.593
15	1 16 6.99	2.4503	11 50 2.0	11.863	15	3 18 59.00	2.6493	19 24 0.9	6.448
16	1 18 34.15	2.4552	12 1 51.6	11.789	16	3 21 38.03	2.6517	19 30 23.4	6.301
17	1 21 1.61	2.4602	12 13 36.7	11.714	17	3 24 17.20	2.6539	19 36 37.0	6.152
18	1 23 29.37	2.4651	12 25 17.3	11.637	18	3 26 56.50	2.6562	19 42 41.6	6.003
19	1 25 57.42	2.4700	12 36 53.2	11.558	19	3 29 35.94	2.6583	19 48 37.3	5.853
20	1 28 25.77	2.4749	12 48 24.3	11.478	20	3 32 15.49	2.6601	19 54 24.0	5.703
21	1 30 54.41	2.4798	12 59 50.6	11.396	21	3 34 55.15	2.6619	20 0 1.6	5.550
22	1 33 23.34	2.4847	13 11 11.8	11.312	22	3 37 34.92	2.6637	20 5 30.0	5.398
23	1 35 52.57	2.4897	13 22 28.0	11.226	23	3 40 14.79	2.6653	20 10 49.3	5.245
24	1 38 22.10	2.4946	+13 33 38.9	+11.138	24	3 42 54.75	2.6667	+20 15 59.4	+ 5.09[illegible]

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
		MAY 1.					MAY 3.		
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 42 54.75	2.6667	+20 15 59.4	+5.091	0	5 50 5.86	2.5833	+21 18 15.8	−2.416
1	3 45 34.79	2.6680	20 21 0.2	4.936	1	5 52 40.72	2.5787	21 15 46.5	2.561
2	3 48 14.91	2.6693	20 25 51.7	4.781	2	5 55 15.30	2.5739	21 13 8.5	2.705
3	3 50 55.10	2.6703	20 30 33.9	4.625	3	5 57 49.59	2.5690	21 10 21.9	2.847
4	3 53 35.34	2.6712	20 35 6.7	4.468	4	6 0 23.58	2.5640	21 7 26.9	2.988
5	3 56 15.64	2.6720	20 39 30.1	4.312	5	6 2 57.27	2.5590	21 4 23.3	3.129
6	3 58 55.98	2.6728	20 43 44.1	4.154	6	6 5 30.66	2.5539	21 1 11.4	3.268
7	4 1 36.37	2.6733	20 47 48.6	3.996	7	6 8 3.74	2.5488	20 57 51.2	3.407
8	4 4 16.78	2.6737	20 51 43.6	3.838	8	6 10 36.51	2.5435	20 54 22.6	3.544
9	4 6 57.21	2.6740	20 55 29.1	3.679	9	6 13 8.96	2.5381	20 50 45.9	3.680
10	4 9 37.66	2.6742	20 59 5.1	3.519	10	6 15 41.08	2.5327	20 47 1.0	3.815
11	4 12 18.11	2.6742	21 2 31.4	3.359	11	6 18 12.88	2.5272	20 43 8.1	3.948
12	4 14 58.56	2.6741	21 5 48.2	3.200	12	6 20 44.34	2.5216	20 39 7.2	4.081
13	4 17 39.00	2.6738	21 8 55.4	3.040	13	6 23 15.47	2.5159	20 34 58.4	4.213
14	4 20 19.42	2.6735	21 11 53.0	2.880	14	6 25 46.25	2.5102	20 30 41.7	4.343
15	4 22 59.82	2.6730	21 14 41.0	2.720	15	6 28 16.69	2.5044	20 26 17.3	4.472
16	4 25 40.18	2.6723	21 17 19.4	2.559	16	6 30 46.78	2.4987	20 21 45.1	4.600
17	4 28 20.49	2.6715	21 19 48.1	2.398	17	6 33 16.53	2.4928	20 17 5.3	4.726
18	4 31 0.76	2.6707	21 22 7.2	2.238	18	6 35 45.92	2.4868	20 12 18.0	4.852
19	4 33 40.97	2.6696	21 24 16.7	2.078	19	6 38 14.95	2.4808	20 7 23.1	4.976
20	4 36 21.11	2.6683	21 26 16.5	1.917	20	6 40 43.62	2.4748	20 2 20.9	5.098
21	4 39 1.17	2.6670	21 28 6.7	1.757	21	6 43 11.93	2.4688	19 57 11.3	5.220
22	4 41 41.15	2.6656	21 29 47.3	1.597	22	6 45 39.87	2.4626	19 51 54.5	5.340
23	4 44 21.04	2.6640	+21 31 18.3	+1.437	23	6 48 7.44	2.4565	+19 46 30.5	−5.459
		MAY 2.					MAY 4.		
0	4 47 0.83	2.6623	+21 32 39.7	+1.277	0	6 50 34.65	2.4503	+19 40 59.4	−5.577
1	4 49 40.51	2.6603	21 33 51.5	1.117	1	6 53 1.48	2.4440	19 35 21.3	5.693
2	4 52 20.07	2.6584	21 34 53.7	0.958	2	6 55 27.93	2.4378	19 29 36.2	5.808
3	4 54 59.52	2.6562	21 35 46.4	0.798	3	6 57 54.01	2.4315	19 23 44.3	5.922
4	4 57 38.82	2.6539	21 36 29.5	0.640	4	7 0 19.71	2.4252	19 17 45.6	6.034
5	5 0 17.99	2.6517	21 37 3.2	0.482	5	7 2 45.03	2.4188	19 11 40.2	6.146
6	5 2 57.02	2.6491	21 37 27.3	0.323	6	7 5 9.96	2.4124	19 5 28.1	6.256
7	5 5 35.88	2.6464	21 37 41.9	0.166	7	7 7 34.52	2.4060	18 59 9.5	6.363
8	5 8 14.59	2.6437	21 37 47.2	+0.009	8	7 9 58.68	2.3995	18 52 44.5	6.471
9	5 10 53.12	2.6408	21 37 43.0	−0.148	9	7 12 22.46	2.3932	18 46 13.0	6.577
10	5 13 31.48	2.6378	21 37 29.4	0.304	10	7 14 45.86	2.3867	18 39 35.3	6.681
11	5 16 9.65	2.6346	21 37 6.5	0.460	11	7 17 8.86	2.3802	18 32 51.3	6.785
12	5 18 47.63	2.6313	21 36 34.2	0.615	12	7 19 31.48	2.3738	18 26 1.1	6.887
13	5 21 25.41	2.6279	21 35 52.7	0.769	13	7 21 53.71	2.3673	18 19 4.9	6.986
14	5 24 2.98	2.6244	21 35 1.9	0.923	14	7 24 15.55	2.3607	18 12 2.8	7.085
15	5 26 40.34	2.6208	21 34 1.9	1.076	15	7 26 36.99	2.3542	18 4 54.7	7.183
16	5 29 17.48	2.6171	21 32 52.8	1.228	16	7 28 58.05	2.3478	17 57 40.8	7.279
17	5 31 54.39	2.6133	21 31 34.5	1.380	17	7 31 18.72	2.3412	17 50 21.2	7.374
18	5 34 31.07	2.6093	21 30 7.2	1.530	18	7 33 38.99	2.3347	17 42 55.9	7.468
19	5 37 7.50	2.6052	21 28 30.9	1.680	19	7 35 58.88	2.3283	17 35 25.0	7.561
20	5 39 43.69	2.6011	21 26 45.6	1.829	20	7 38 18.38	2.3218	17 27 48.6	7.652
21	5 42 19.63	2.5968	21 24 51.4	1.978	21	7 40 37.49	2.3153	17 20 6.8	7.741
22	5 44 55.31	2.5924	21 22 48.3	2.125	22	7 42 56.21	2.3088	17 12 19.7	7.830
23	5 47 30.72	2.5879	21 20 36.4	2.271	23	7 45 14.55	2.3023	17 4 27.2	7.918
24	5 50 5.86	2.5833	+21 18 15.8	−2.416	24	7 47 32.49	2.2958	+16 56 29.6	−8.003

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 5.					MAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 47 32.49	2.2958	+16 56 29.6	− 8.008	0	9 30 55.36	2.0288	+9 16 54.1	−10.712
1	7 49 50.05	2.2895	16 48 26.9	8.088	1	9 32 56.96	2.0246	9 6 10.5	10.742
2	7 52 7.23	2.2831	16 40 19.1	8.171	2	9 34 58.31	2.0203	8 55 25.1	10.772
3	7 54 24.02	2.2767	16 32 6.4	8.252	3	9 36 59.40	2.0162	8 44 37.9	10.800
4	7 56 40.43	2.2703	16 23 48.9	8.333	4	9 39 0.25	2.0121	8 33 49.1	10.828
5	7 58 56.46	2.2639	16 15 26.5	8.412	5	9 41 0.85	2.0079	8 22 58.6	10.855
6	8 1 12.10	2.2576	16 6 59.4	8.490	6	9 43 1.20	2.0039	8 12 6.5	10.881
7	8 3 27.37	2.2513	15 58 27.7	8.566	7	9 45 1.32	2.0000	8 1 12.9	10.905
8	8 5 42.26	2.2451	15 49 51.3	8.643	8	9 47 1.20	1.9961	7 50 17.9	10.929
9	8 7 56.78	2.2388	15 41 10.5	8.717	9	9 49 0.85	1.9923	7 39 21.4	10.953
10	8 10 10.92	2.2326	15 32 25.3	8.790	10	9 51 0.27	1.9885	7 28 23.6	10.975
11	8 12 24.69	2.2264	15 23 35.7	8.862	11	9 52 59.47	1.9848	7 17 24.4	10.997
12	8 14 38.09	2.2203	15 14 41.9	8.932	12	9 54 58.45	1.9812	7 6 24.0	11.017
13	8 16 51.12	2.2142	15 5 43.9	9.001	13	9 56 57.22	1.9777	6 55 22.4	11.037
14	8 19 3.79	2.2081	14 56 41.8	9.069	14	9 58 55.77	1.9741	6 44 19.6	11.056
15	8 21 16.09	2.2020	14 47 35.6	9.136	15	10 0 54.11	1.9707	6 33 15.7	11.074
16	8 23 28.03	2.1960	14 38 25.5	9.202	16	10 2 52.25	1.9673	6 22 10.7	11.092
17	8 25 39.61	2.1900	14 29 11.4	9.266	17	10 4 50.18	1.9639	6 11 4.7	11.108
18	8 27 50.83	2.1841	14 19 53.6	9.328	18	10 6 47.92	1.9607	5 59 57.7	11.124
19	8 30 1.70	2.1783	14 10 32.0	9.391	19	10 8 45.46	1.9575	5 48 49.8	11.138
20	8 32 12.22	2.1723	14 1 6.7	9.453	20	10 10 42.82	1.9543	5 37 41.1	11.153
21	8 34 22.38	2.1665	13 51 37.7	9.512	21	10 12 39.98	1.9513	5 26 31.5	11.166
22	8 36 32.20	2.1608	13 42 5.3	9.570	22	10 14 36.97	1.9483	5 15 21.2	11.178
23	8 38 41.68	2.1551	+13 32 29.3	− 9.628	23	10 16 33.77	1.9453	+5 4 10.1	−11.191
	MAY 6.					MAY 8.			
0	8 40 50.81	2.1493	+13 22 50.0	− 9.683	0	10 18 30.40	1.9424	+4 52 58.3	−11.202
1	8 42 59.60	2.1438	13 13 7.3	9.738	1	10 20 26.86	1.9396	4 41 45.9	11.212
2	8 45 8.06	2.1383	13 3 21.4	9.792	2	10 22 23.15	1.9368	4 30 32.9	11.222
3	8 47 16.19	2.1327	12 53 32.3	9.845	3	10 24 19.28	1.9342	4 19 19.3	11.231
4	8 49 23.98	2.1272	12 43 40.0	9.898	4	10 26 15.25	1.9315	4 8 5.2	11.239
5	8 51 31.45	2.1218	12 33 44.6	9.948	5	10 28 11.06	1.9288	3 56 50.6	11.246
6	8 53 38.59	2.1163	12 23 46.3	9.997	6	10 30 6.71	1.9263	3 45 35.7	11.252
7	8 55 45.41	2.1110	12 13 45.0	10.046	7	10 32 2.22	1.9239	3 34 20.4	11.258
8	8 57 51.91	2.1058	12 3 40.8	10.093	8	10 33 57.58	1.9215	3 23 4.7	11.263
9	8 59 58.10	2.1006	11 53 33.9	10.138	9	10 35 52.80	1.9192	3 11 48.8	11.268
10	9 2 3.98	2.0953	11 43 24.2	10.185	10	10 37 47.88	1.9169	3 0 32.6	11.271
11	9 4 9.54	2.0902	11 33 11.7	10.229	11	10 39 42.83	1.9148	2 49 16.3	11.273
12	9 6 14.80	2.0852	11 22 56.7	10.272	12	10 41 37.65	1.9126	2 37 59.8	11.276
13	9 8 19.76	2.0802	11 12 39.1	10.314	13	10 43 32.34	1.9105	2 26 43.2	11.278
14	9 10 24.42	2.0753	11 2 19.0	10.355	14	10 45 26.91	1.9085	2 15 26.5	11.278
15	9 12 28.79	2.0703	10 51 56.5	10.395	15	10 47 21.36	1.9065	2 4 9.8	11.278
16	9 14 32.86	2.0655	10 41 31.6	10.434	16	10 49 15.69	1.9046	1 52 53.1	11.278
17	9 16 36.65	2.0608	10 31 4.4	10.472	17	10 51 9.91	1.9028	1 41 36.4	11.277
18	9 18 40.15	2.0560	10 20 35.0	10.509	18	10 53 4.02	1.9009	1 30 19.9	11.274
19	9 20 43.37	2.0513	10 10 3.3	10.546	19	10 54 58.02	1.8992	1 19 3.5	11.272
20	9 22 46.31	2.0467	9 59 29.5	10.581	20	10 56 51.92	1.8976	1 7 47.3	11.268
21	9 24 48.97	2.0422	9 48 53.6	10.615	21	10 58 45.73	1.8960	0 56 31.3	11.265
22	9 26 51.37	2.0378	9 38 15.7	10.648	22	11 0 39.44	1.8944	0 45 15.5	11.260
23	9 28 53.50	2.0333	9 27 35.9	10.680	23	11 2 33.06	1.8929	0 34 0.1	11.254
24	9 30 55.36	2.0288	+ 9 16 54.1	−10.712	24	11 4 26.59	1.8915	+0 22 45.0	−11.248

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 9.					MAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 4 26.59	1.8915	+0 22 45.0	−11.248	0	12 34 38.41	1.8865	− 8 18 3.9	−10.212
1	11 6 20.04	1.8901	0 11 30.3	11.242	1	12 36 31.63	1.8876	8 28 15.5	10.175
2	11 8 13.40	1.8888	+0 0 16.0	11.234	2	12 38 24.92	1.8888	8 38 24.9	10.138
3	11 10 6.69	1.8876	−0 10 57.8	11.226	3	12 40 18.28	1.8899	8 48 32.1	10.100
4	11 11 59.91	1.8864	0 22 11.1	11.218	4	12 42 11.71	1.8911	8 58 36.9	10.061
5	11 13 53.06	1.8853	0 33 23.9	11.208	5	12 44 5.21	1.8923	9 8 39.4	10.023
6	11 15 46.14	1.8841	0 44 36.1	11.198	6	12 45 58.79	1.8937	9 18 39.6	9.983
7	11 17 39.15	1.8831	0 55 47.7	11.188	7	12 47 52.45	1.8950	9 28 37.3	9.942
8	11 19 32.11	1.8822	1 6 58.6	11.177	8	12 49 46.19	1.8963	9 38 32.6	9.901
9	11 21 25.01	1.8812	1 18 8.9	11.165	9	12 51 40.01	1.8978	9 48 25.4	9.859
10	11 23 17.85	1.8803	1 29 18.4	11.153	10	12 53 33.92	1.8992	9 58 15.7	9.817
11	11 25 10.65	1.8796	1 40 27.2	11.139	11	12 55 27.91	1.9007	10 8 3.4	9.773
12	11 27 3.40	1.8788	1 51 35.1	11.125	12	12 57 22.00	1.9023	10 17 48.5	9.730
13	11 28 56.11	1.8782	2 2 42.2	11.111	13	12 59 16.18	1.9038	10 27 31.0	9.686
14	11 30 48.78	1.8775	2 13 48.4	11.095	14	13 1 10.45	1.9053	10 37 10.8	9.641
15	11 32 41.41	1.8769	2 24 53.6	11.080	15	13 3 4.82	1.9070	10 46 47.9	9.596
16	11 34 34.01	1.8763	2 35 58.0	11.064	16	13 4 59.29	1.9087	10 56 22.3	9.550
17	11 36 26.57	1.8759	2 47 1.3	11.046	17	13 6 53.86	1.9103	11 5 53.9	9.503
18	11 38 19.12	1.8756	2 58 3.5	11.028	18	13 8 48.53	1.9121	11 15 22.6	9.455
19	11 40 11.64	1.8752	3 9 4.7	11.011	19	13 10 43.31	1.9138	11 24 48.5	9.408
20	11 42 4.14	1.8748	3 20 4.8	10.993	20	13 12 38.19	1.9156	11 34 11.5	9.359
21	11 43 56.62	1.8746	3 31 3.8	10.973	21	13 14 33.18	1.9174	11 43 31.6	9.310
22	11 45 49.09	1.8744	3 42 1.5	10.952	22	13 16 28.28	1.9193	11 52 48.7	9.260
23	11 47 41.55	1.8743	−3 52 58.0	−10.932	23	13 18 23.49	1.9212	−12 2 2.8	− 9.209
	MAY 10.					MAY 12.			
0	11 49 34.00	1.8742	−4 3 53.3	−10.911	0	13 20 18.82	1.9231	−12 11 13.8	− 9.158
1	11 51 26.45	1.8742	4 14 47.3	10.888	1	13 22 14.26	1.9250	12 20 21.8	9.107
2	11 53 18.90	1.8741	4 25 39.9	10.865	2	13 24 9.82	1.9270	12 29 26.6	9.054
3	11 55 11.34	1.8742	4 36 31.1	10.842	3	13 26 5.50	1.9291	12 38 28.3	9.002
4	11 57 3.80	1.8742	4 47 20.9	10.818	4	13 28 1.31	1.9311	12 47 26.8	8.948
5	11 58 56.26	1.8744	4 58 9.3	10.794	5	13 29 57.23	1.9331	12 56 22.1	8.894
6	12 0 48.73	1.8747	5 8 56.2	10.768	6	13 31 53.28	1.9352	13 5 14.1	8.839
7	12 2 41.22	1.8749	5 19 41.5	10.743	7	13 33 49.45	1.9373	13 14 2.8	8.783
8	12 4 33.72	1.8752	5 30 25.3	10.717	8	13 35 45.76	1.9395	13 22 48.1	8.728
9	12 6 26.24	1.8756	5 41 7.5	10.690	9	13 37 42.19	1.9416	13 31 30.1	8.670
10	12 8 18.79	1.8760	5 51 48.1	10.663	10	13 39 38.75	1.9438	13 40 8.5	8.613
11	12 10 11.36	1.8764	6 2 27.0	10.634	11	13 41 35.44	1.9460	13 48 43.6	8.556
12	12 12 3.96	1.8769	6 13 4.2	10.605	12	13 43 32.27	1.9483	13 57 15.2	8.498
13	12 13 56.59	1.8775	6 23 39.6	10.576	13	13 45 29.23	1.9505	14 5 43.3	8.438
14	12 15 49.26	1.8781	6 34 13.3	10.547	14	13 47 26.33	1.9528	14 14 7.8	8.378
15	12 17 41.96	1.8787	6 44 45.2	10.516	15	13 49 23.57	1.9551	14 22 28.6	8.318
16	12 19 34.70	1.8794	6 55 15.2	10.484	16	13 51 20.94	1.9574	14 30 45.9	8.257
17	12 21 27.49	1.8802	7 5 43.3	10.451	17	13 53 18.46	1.9598	14 38 59.4	8.194
18	12 23 20.32	1.8809	7 16 9.4	10.419	18	13 55 16.12	1.9621	14 47 9.2	8.133
19	12 25 13.20	1.8818	7 26 33.6	10.388	19	13 57 13.91	1.9644	14 55 15.3	8.070
20	12 27 6.13	1.8826	7 36 55.9	10.353	20	13 59 11.85	1.9669	15 3 17.6	8.006
21	12 28 59.11	1.8835	7 47 16.0	10.318	21	14 1 9.94	1.9603	15 11 16.0	7.942
22	12 30 52.15	1.8845	7 57 34.1	10.284	22	14 3 8.17	1.9717	15 19 10.6	7.877
23	12 32 45.25	1.8855	8 7 50.1	10.248	23	14 5 6.54	1.9741	15 27 1.2	7.811
24	12 34 38.41	1.8865	−8 18 3.9	−10.212	24	14 7 5.06	1.9766	−15 34 47.9	− 7.745

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
		MAY 13.		
	h m s	s	° ′ ″	″
0	14 7 5.06	1.9766	−15 34 47.9	−7.745
1	14 9 3.73	1.9790	15 42 30.6	7.678
2	14 11 2.54	1.9815	15 50 9.3	7.612
3	14 13 1.51	1.9840	15 57 44.0	7.544
4	14 15 0.62	1.9865	16 5 14.6	7.475
5	14 16 59.89	1.9890	16 12 41.0	7.406
6	14 18 59.30	1.9915	16 20 3.3	7.336
7	14 20 58.87	1.9940	16 27 21.3	7.266
8	14 22 58.58	1.9965	16 34 35.2	7.195
9	14 24 58.45	1.9992	16 41 44.7	7.123
10	14 26 58.48	2.0017	16 48 50.0	7.052
11	14 28 58.65	2.0042	16 55 50.9	6.978
12	14 30 58.98	2.0068	17 2 47.4	6.905
13	14 32 59.46	2.0093	17 9 39.5	6.831
14	14 35 0.10	2.0119	17 16 27.1	6.757
15	14 37 0.89	2.0145	17 23 10.3	6.682
16	14 39 1.84	2.0171	17 29 48.9	6.605
17	14 41 2.94	2.0196	17 36 22.9	6.529
18	14 43 4.19	2.0222	17 42 52.4	6.453
19	14 45 5.60	2.0248	17 49 17.2	6.375
20	14 47 7.16	2.0273	17 55 37.4	6.297
21	14 49 8.88	2.0299	18 1 52.8	6.218
22	14 51 10.75	2.0324	18 8 3.5	6.139
23	14 53 12.77	2.0349	−18 14 9.5	−6.059
		MAY 14.		
0	14 55 14.94	2.0375	−18 20 10.6	−5.978
1	14 57 17.27	2.0401	18 26 6.9	5.898
2	14 59 19.75	2.0426	18 31 58.3	5.817
3	15 1 22.38	2.0452	18 37 44.9	5.735
4	15 3 25.17	2.0477	18 43 26.5	5.652
5	15 5 28.10	2.0502	18 49 3.1	5.568
6	15 7 31.19	2.0528	18 54 34.7	5.484
7	15 9 34.43	2.0552	19 0 1.2	5.400
8	15 11 37.81	2.0576	19 5 22.7	5.316
9	15 13 41.34	2.0602	19 10 39.1	5.231
10	15 15 45.03	2.0627	19 15 50.4	5.145
11	15 17 48.86	2.0650	19 20 56.5	5.058
12	15 19 52.83	2.0674	19 25 57.4	4.972
13	15 21 56.95	2.0698	19 30 53.1	4.884
14	15 24 1.21	2.0723	19 35 43.5	4.797
15	15 26 5.62	2.0747	19 40 28.7	4.708
16	15 28 10.17	2.0770	19 45 8.5	4.618
17	15 30 14.86	2.0793	19 49 42.9	4.529
18	15 32 19.68	2.0816	19 54 12.0	4.440
19	15 34 24.65	2.0840	19 58 35.7	4.350
20	15 36 29.76	2.0863	20 2 54.0	4.258
21	15 38 35.00	2.0884	20 7 6.7	4.167
22	15 40 40.37	2.0907	20 11 14.0	4.076
23	15 42 45.88	2.0929	20 15 15.8	3.983
24	15 44 51.52	2.0951	−20 19 12.0	−3.891

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
		MAY 15.		
	h m s	s	° ′ ″	″
0	15 44 51.52	2.0951	−20 19 12.0	−3.891
1	15 46 57.29	2.0973	20 23 2.7	3.798
2	15 49 3.19	2.0994	20 26 47.7	3.704
3	15 51 9.22	2.1015	20 30 27.2	3.611
4	15 53 15.37	2.1035	20 34 1.0	3.516
5	15 55 21.64	2.1057	20 37 29.1	3.421
6	15 57 28.04	2.1077	20 40 51.5	3.326
7	15 59 34.56	2.1096	20 44 8.2	3.230
8	16 1 41.19	2.1116	20 47 19.1	3.134
9	16 3 47.95	2.1136	20 50 24.3	3.038
10	16 5 54.82	2.1154	20 53 23.7	2.941
11	16 8 1.80	2.1173	20 56 17.2	2.843
12	16 10 8.89	2.1191	20 59 4.9	2.747
13	16 12 16.09	2.1209	21 1 46.8	2.648
14	16 14 23.40	2.1228	21 4 22.7	2.550
15	16 16 30.82	2.1245	21 6 52.8	2.452
16	16 18 38.34	2.1262	21 9 16.9	2.353
17	16 20 45.96	2.1278	21 11 35.1	2.253
18	16 22 53.68	2.1295	21 13 47.3	2.154
19	16 25 1.50	2.1311	21 15 53.6	2.055
20	16 27 9.41	2.1326	21 17 53.9	1.954
21	16 29 17.41	2.1342	21 19 48.1	1.853
22	16 31 25.51	2.1357	21 21 36.3	1.753
23	16 33 33.69	2.1371	−21 23 18.5	−1.653
		MAY 16.		
0	16 35 41.96	2.1385	−21 24 54.6	−1.551
1	16 37 50.31	2.1399	21 26 24.6	1.449
2	16 39 58.75	2.1413	21 27 48.5	1.348
3	16 42 7.26	2.1425	21 29 6.4	1.247
4	16 44 15.85	2.1438	21 30 18.1	1.143
5	16 46 24.51	2.1450	21 31 23.6	1.041
6	16 48 33.25	2.1462	21 32 23.0	0.939
7	16 50 42.05	2.1473	21 33 16.3	0.836
8	16 52 50.93	2.1484	21 34 3.3	0.733
9	16 54 59.86	2.1494	21 34 44.2	0.630
10	16 57 8.86	2.1505	21 35 18.9	0.527
11	16 59 17.92	2.1515	21 35 47.4	0.423
12	17 1 27.04	2.1524	21 36 9.7	0.320
13	17 3 36.21	2.1533	21 36 25.8	0.216
14	17 5 45.44	2.1542	21 36 35.6	0.111
15	17 7 54.71	2.1550	21 36 39.1	−0.008
16	17 10 4.04	2.1558	21 36 36.5	+0.097
17	17 12 13.40	2.1564	21 36 27.5	0.202
18	17 14 22.81	2.1572	21 36 12.3	0.305
19	17 16 32.26	2.1578	21 35 50.9	0.410
20	17 18 41.75	2.1583	21 35 23.1	0.515
21	17 20 51.26	2.1580	21 34 49.1	0.619
22	17 23 0.82	2.1595	21 34 8.8	0.723
23	17 25 10.40	2.1599	21 33 22.3	0.828
24	17 27 20.01	2.1604	−21 32 29.4	+0.933

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 17.					MAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 27 20.01	2.1604	−21 32 29.4	+0.933	0	19 10 50.31	2.1406	−18 48 35.9	+5.821
1	17 29 29.65	2.1608	21 31 30.3	1.038	1	19 12 58.71	2.1396	18 42 43.8	5.916
2	17 31 39.31	2.1612	21 30 24.8	1.143	2	19 15 7.06	2.1386	18 36 46.0	6.011
3	17 33 48.99	2.1614	21 29 13.1	1.248	3	19 17 15.34	2.1375	18 30 42.5	6.105
4	17 35 58.68	2.1618	21 27 55.1	1.353	4	19 19 23.56	2.1364	18 24 33.4	6.199
5	17 38 8.40	2.1620	21 26 30.8	1.458	5	19 21 31.71	2.1353	18 18 18.6	6.293
6	17 40 18.12	2.1622	21 25 0.2	1.562	6	19 23 39.80	2.1343	18 11 58.3	6.386
7	17 42 27.86	2.1623	21 23 23.4	1.667	7	19 25 47.83	2.1333	18 5 32.3	6.479
8	17 44 37.60	2.1625	21 21 40.2	1.772	8	19 27 55.79	2.1322	17 59 0.8	6.572
9	17 46 47.36	2.1626	21 19 50.8	1.876	9	19 30 3.69	2.1312	17 52 23.7	6.664
10	17 48 57.11	2.1626	21 17 55.1	1.981	10	19 32 11.53	2.1301	17 45 41.1	6.755
11	17 51 6.87	2.1626	21 15 53.1	2.086	11	19 34 19.30	2.1289	17 38 53.1	6.846
12	17 53 16.62	2.1625	21 13 44.8	2.190	12	19 36 27.00	2.1278	17 31 59.6	6.937
13	17 55 26.37	2.1625	21 11 30.3	2.294	13	19 38 34.64	2.1268	17 25 0.7	7.028
14	17 57 36.12	2.1624	21 9 9.5	2.398	14	19 40 42.21	2.1257	17 17 56.3	7.118
15	17 59 45.86	2.1622	21 6 42.5	2.503	15	19 42 49.72	2.1245	17 10 46.6	7.206
16	18 1 55.58	2.1620	21 4 9.2	2.607	16	19 44 57.15	2.1233	17 3 31.6	7.295
17	18 4 5.30	2.1618	21 1 29.7	2.710	17	19 47 4.52	2.1223	16 56 11.2	7.384
18	18 6 15.00	2.1616	20 58 44.0	2.814	18	19 49 11.83	2.1212	16 48 45.5	7.471
19	18 8 24.69	2.1613	20 55 52.0	2.918	19	19 51 19.07	2.1202	16 41 14.7	7.558
20	18 10 34.35	2.1609	20 52 53.9	3.021	20	19 53 26.25	2.1191	16 33 38.6	7.645
21	18 12 44.00	2.1607	20 49 49.5	3.125	21	19 55 33.36	2.1179	16 25 57.3	7.732
22	18 14 53.63	2.1603	20 46 38.9	3.228	22	19 57 40.40	2.1168	16 18 10.8	7.818
23	18 17 3.23	2.1508	−20 43 22.2	+3.330	23	19 59 47.38	2.1158	−16 10 19.2	+7.903
	MAY 18.					MAY 20.			
0	18 19 12.80	2.1593	−20 39 59.3	+3.433	0	20 1 54.30	2.1148	−16 2 22.5	+7.987
1	18 21 22.35	2.1588	20 36 30.2	3.536	1	20 4 1.15	2.1138	15 54 20.8	8.071
2	18 23 31.86	2.1583	20 32 55.0	3.638	2	20 6 7.95	2.1128	15 46 14.0	8.155
3	18 25 41.34	2.1578	20 29 13.7	3.740	3	20 8 14.68	2.1116	15 38 2.2	8.238
4	18 27 50.79	2.1572	20 25 26.2	3.843	4	20 10 21.34	2.1106	15 29 45.4	8.321
5	18 30 0.20	2.1566	20 21 32.6	3.944	5	20 12 27.95	2.1097	15 21 23.7	8.403
6	18 32 9.58	2.1560	20 17 32.9	4.045	6	20 14 34.50	2.1087	15 12 57.1	8.483
7	18 34 18.92	2.1553	20 13 27.2	4.146	7	20 16 40.99	2.1077	15 4 25.7	8.564
8	18 36 28.21	2.1546	20 9 15.4	4.248	8	20 18 47.42	2.1068	14 55 49.4	8.645
9	18 38 37.47	2.1539	20 4 57.5	4.348	9	20 20 53.80	2.1058	14 47 8.3	8.725
10	18 40 46.68	2.1531	20 0 33.6	4.448	10	20 23 0.12	2.1049	14 38 22.4	8.804
11	18 42 55.84	2.1523	19 56 3.7	4.548	11	20 25 6.39	2.1040	14 29 31.8	8.883
12	18 45 4.96	2.1516	19 51 27.8	4.648	12	20 27 12.60	2.1031	14 20 36.5	8.960
13	18 47 14.03	2.1508	19 46 45.9	4.748	13	20 29 18.76	2.1023	14 11 36.6	9.038
14	18 49 23.06	2.1500	19 41 58.1	4.848	14	20 31 24.87	2.1014	14 2 32.0	9.115
15	18 51 32.03	2.1491	19 37 4.2	4.947	15	20 33 30.93	2.1006	13 53 22.8	9.191
16	18 53 40.95	2.1482	19 32 4.5	5.044	16	20 35 36.94	2.0998	13 44 9.1	9.267
17	18 55 49.81	2.1473	19 26 58.9	5.143	17	20 37 42.91	2.0991	13 34 50.8	9.343
18	18 57 58.63	2.1465	19 21 47.4	5.241	18	20 39 48.83	2.0983	13 25 28.0	9.417
19	19 0 7.39	2.1455	19 16 30.0	5.338	19	20 41 54.70	2.0975	13 16 0.8	9.490
20	19 2 16.09	2.1445	19 11 6.8	5.436	20	20 44 0.53	2.0969	13 6 29.2	9.563
21	19 4 24.73	2.1436	19 5 37.7	5.533	21	20 46 6.33	2.0963	12 56 53.2	9.636
22	19 6 33.32	2.1426	19 0 2.9	5.628	22	20 48 12.08	2.0955	12 47 12.9	9.708
23	19 8 41.84	2.1416	18 54 22.3	5.725	23	20 50 17.79	2.0949	12 37 28.3	9.779
24	19 10 50.31	2.1406	−18 48 35.9	+5.821	24	20 52 23.47	2.0944	−12 27 39.4	+9.850

MOON, 1919.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 21.					MAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 52 23.47	2.0944	−12 27 39.4	+ 9.850	0	22 32 59.40	2.1152	−3 26 58.1	+12.378
1	20 54 29.12	2.0938	12 17 46.3	9.920	1	22 35 6.36	2.1169	3 14 34.4	12.411
2	20 56 34.73	2.0933	12 7 49.0	9.989	2	22 37 13.43	2.1187	3 2 8.8	12.442
3	20 58 40.31	2.0928	11 57 47.6	10.058	3	22 39 20.60	2.1204	2 49 41.4	12.473
4	21 0 45.87	2.0924	11 47 42.1	10.126	4	22 41 27.88	2.1223	2 37 12.1	12.502
5	21 2 51.40	2.0919	11 37 32.5	10.193	5	22 43 35.27	2.1242	2 24 41.2	12.530
6	21 4 56.90	2.0915	11 27 18.9	10.260	6	22 45 42.78	2.1262	2 12 8.5	12.558
7	21 7 2.38	2.0913	11 17 1.3	10.326	7	22 47 50.41	2.1283	1 59 34.3	12.583
8	21 9 7.85	2.0909	11 6 39.8	10.391	8	22 49 58.17	2.1303	1 46 58.5	12.609
9	21 11 13.29	2.0906	10 56 14.4	10.456	9	22 52 6.05	2.1325	1 34 21.2	12.633
10	21 13 18.72	2.0904	10 45 45.1	10.520	10	22 54 14.07	2.1348	1 21 42.5	12.656
11	21 15 24.14	2.0902	10 35 12.0	10.583	11	22 56 22.22	2.1370	1 9 2.5	12.678
12	21 17 29.54	2.0900	10 24 35.2	10.645	12	22 58 30.51	2.1393	0 56 21.1	12.700
13	21 19 34.94	2.0899	10 13 54.6	10.707	13	23 0 38.94	2.1418	0 43 38.5	12.719
14	21 21 40.33	2.0898	10 3 10.4	10.768	14	23 2 47.52	2.1443	0 30 54.8	12.738
15	21 23 45.71	2.0898	9 52 22.4	10.829	15	23 4 56.25	2.1468	0 18 9.9	12.757
16	21 25 51.10	2.0898	9 41 30.9	10.888	16	23 7 5.14	2.1494	−0 5 24.0	12.773
17	21 27 56.48	2.0898	9 30 35.8	10.948	17	23 9 14.18	2.1520	+0 7 22.8	12.788
18	21 30 1.87	2.0899	9 19 37.2	11.005	18	23 11 23.38	2.1547	0 20 10.6	12.803
19	21 32 7.27	2.0900	9 8 35.2	11.063	19	23 13 32.74	2.1575	0 32 59.2	12.817
20	21 34 12.67	2.0902	8 57 29.7	11.119	20	23 15 42.28	2.1604	0 45 48.6	12.829
21	21 36 18.09	2.0904	8 46 20.9	11.175	21	23 17 51.99	2.1633	0 58 38.7	12.841
22	21 38 23.52	2.0906	8 35 8.7	11.231	22	23 20 1.87	2.1662	1 11 29.5	12.851
23	21 40 28.96	2.0909	− 8 23 53.2	+11.285	23	23 22 11.93	2.1693	+1 24 20.8	+12.859
	MAY 22.					MAY 24.			
0	21 42 34.43	2.0913	− 8 12 34.5	+11.338	0	23 24 22.18	2.1724	+1 37 12.6	+12.867
1	21 44 39.92	2.0918	8 1 12.6	11.392	1	23 26 32.62	2.1755	1 50 4.8	12.873
2	21 46 45.44	2.0922	7 49 47.5	11.444	2	23 28 43.24	2.1787	2 2 57.4	12.878
3	21 48 50.98	2.0926	7 38 19.3	11.496	3	23 30 54.06	2.1820	2 15 50.2	12.882
4	21 50 56.55	2.0932	7 26 48.0	11.546	4	23 33 5.08	2.1853	2 28 43.2	12.885
5	21 53 2.16	2.0938	7 15 13.8	11.595	5	23 35 16.30	2.1888	2 41 36.4	12.887
6	21 55 7.81	2.0945	7 3 36.6	11.645	6	23 37 27.73	2.1923	2 54 29.6	12.887
7	21 57 13.50	2.0952	6 51 56.4	11.693	7	23 39 39.37	2.1958	3 7 22.8	12.886
8	21 59 19.23	2.0958	6 40 13.4	11.740	8	23 41 51.22	2.1993	3 20 15.9	12.883
9	22 1 25.00	2.0967	6 28 27.6	11.787	9	23 44 3.28	2.2029	3 33 8.8	12.879
10	22 3 30.83	2.0976	6 16 39.0	11.833	10	23 46 15.57	2.2067	3 46 1.4	12.875
11	22 5 36.71	2.0984	6 4 47.7	11.877	11	23 48 28.08	2.2103	3 58 53.8	12.869
12	22 7 42.64	2.0993	5 52 53.8	11.920	12	23 50 40.81	2.2142	4 11 45.7	12.861
13	22 9 48.63	2.1004	5 40 57.3	11.964	13	23 52 53.78	2.2181	4 24 37.1	12.853
14	22 11 54.69	2.1015	5 28 58.1	12.007	14	23 55 6.98	2.2219	4 37 28.0	12.843
15	22 14 0.81	2.1026	5 16 56.5	12.048	15	23 57 20.41	2.2259	4 50 18.2	12.831
16	22 16 7.00	2.1038	5 4 52.4	12.088	16	23 59 34.09	2.2301	5 3 7.7	12.818
17	22 18 13.26	2.1050	4 52 46.0	12.127	17	0 1 48.02	2.2342	5 15 56.3	12.803
18	22 20 19.60	2.1063	4 40 37.2	12.166	18	0 4 2.19	2.2383	5 28 44.1	12.788
19	22 22 26.02	2.1076	4 28 26.1	12.204	19	0 6 16.61	2.2425	5 41 30.9	12.771
20	22 24 32.51	2.1090	4 16 12.7	12.241	20	0 8 31.29	2.2468	5 54 16.6	12.753
21	22 26 39.10	2.1105	4 3 57.2	12.277	21	0 10 46.23	2.2512	6 7 1.2	12.733
22	22 28 45.77	2.1120	3 51 39.5	12.312	22	0 13 1.43	2.2555	6 19 44.5	12.711
23	22 30 52.54	2.1136	3 39 19.8	12.345	23	0 15 16.89	2.2599	6 32 26.5	12.688
24	22 32 59.40	2.1152	− 3 26 58.1	+12.378	24	0 17 32.62	2.2644	+6 45 7.1	+12.[illegible]

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 25.					MAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 17 32.62	2.2644	+ 6 45 7.1	+12.664	0	2 12 9.11	2.5188	+15 55 1.8	+9.608
1	0 19 48.62	2.2690	6 57 46.2	12.638	1	2 14 40.40	2.5241	16 4 35.2	9.503
2	0 22 4.90	2.2736	7 10 23.7	12.611	2	2 17 12.00	2.5294	16 14 2.2	9.397
3	0 24 21.45	2.2782	7 22 59.5	12.583	3	2 19 43.93	2.5348	16 23 22.8	9.289
4	0 26 38.28	2.2829	7 35 33.6	12.553	4	2 22 16.18	2.5401	16 32 36.9	9.179
5	0 28 55.40	2.2877	7 48 5.8	12.521	5	2 24 48.74	2.5453	16 41 44.3	9.067
6	0 31 12.80	2.2924	8 0 36.1	12.488	6	2 27 21.62	2.5505	16 50 44.9	8.953
7	0 33 30.49	2.2973	8 13 4.3	12.453	7	2 29 54.80	2.5557	16 59 38.7	8.839
8	0 35 48.48	2.3023	8 25 30.5	12.417	8	2 32 28.30	2.5608	17 8 25.6	8.723
9	0 38 6.76	2.3071	8 37 54.3	12.378	9	2 35 2.10	2.5658	17 17 5.5	8.605
10	0 40 25.33	2.3121	8 50 15.9	12.340	10	2 37 36.20	2.5708	17 25 38.2	8.485
11	0 42 44.21	2.3171	9 2 35.1	12.298	11	2 40 10.60	2.5758	17 34 3.7	8.364
12	0 45 3.38	2.3221	9 14 51.7	12.255	12	2 42 45.29	2.5807	17 42 21.9	8.242
13	0 47 22.86	2.3273	9 27 5.7	12.211	13	2 45 20.28	2.5855	17 50 32.7	8.118
14	0 49 42.65	2.3324	9 39 17.0	12.166	14	2 47 55.55	2.5902	17 58 36.0	7.992
15	0 52 2.75	2.3376	9 51 25.6	12.118	15	2 50 31.10	2.5949	18 6 31.7	7.864
16	0 54 23.16	2.3428	10 3 31.2	12.068	16	2 53 6.94	2.5096	18 14 19.7	7.735
17	0 56 43.88	2.3480	10 15 33.8	12.018	17	2 55 43.05	2.6041	18 21 59.9	7.605
18	0 59 4.92	2.3533	10 27 33.4	11.967	18	2 58 19.43	2.6085	18 29 32.3	7.474
19	1 1 26.28	2.3587	10 39 29.8	11.912	19	3 0 56.07	2.6128	18 36 56.8	7.342
20	1 3 47.96	2.3639	10 51 22.8	11.856	20	3 3 32.97	2.6172	18 44 13.3	7.208
21	1 6 9.95	2.3693	11 3 12.5	11.800	21	3 6 10.13	2.6214	18 51 21.7	7.072
22	1 8 32.27	2.3748	11 14 58.8	11.741	22	3 8 47.54	2.6255	18 58 21.9	6.935
23	1 10 54.92	2.3802	+11 26 41.4	+11.679	23	3 11 25.19	2.6295	+19 5 13.9	+6.797
	MAY 26.					MAY 28.			
0	1 13 17.89	2.3856	+11 38 20.3	+11.617	0	3 14 3.08	2.6335	+19 11 57.5	+6.657
1	1 15 41.19	2.3911	11 49 55.4	11.553	1	3 16 41.21	2.6373	19 18 32.7	6.517
2	1 18 4.82	2.3966	12 1 26.7	11.488	2	3 19 19.56	2.6410	19 24 59.5	6.374
3	1 20 28.78	2.4021	12 12 53.9	11.420	3	3 21 58.13	2.6447	19 31 17.6	6.231
4	1 22 53.07	2.4077	12 24 17.1	11.351	4	3 24 36.92	2.6482	19 37 27.2	6.088
5	1 25 17.70	2.4132	12 35 36.0	11.280	5	3 27 15.91	2.6516	19 43 28.1	5.942
6	1 27 42.65	2.4187	12 46 50.7	11.208	6	3 29 55.11	2.6549	19 49 20.2	5.795
7	1 30 7.94	2.4243	12 58 0.9	11.133	7	3 32 34.50	2.6581	19 55 3.5	5.648
8	1 32 33.57	2.4299	13 9 6.7	11.058	8	3 35 14.08	2.6612	20 0 37.9	5.499
9	1 34 59.53	2.4355	13 20 7.8	10.980	9	3 37 53.84	2.6642	20 6 3.4	5.349
10	1 37 25.83	2.4411	13 31 4.3	10.901	10	3 40 33.78	2.6671	20 11 19.8	5.198
11	1 39 52.46	2.4467	13 41 55.9	10.819	11	3 43 13.89	2.6698	20 16 27.2	5.048
12	1 42 19.43	2.4523	13 52 42.6	10.737	12	3 45 54.15	2.6723	20 21 25.5	4.895
13	1 44 46.73	2.4578	14 3 24.3	10.652	13	3 48 34.57	2.6748	20 26 14.6	4.741
14	1 47 14.37	2.4635	14 14 0.8	10.566	14	3 51 15.13	2.6772	20 30 54.4	4.587
15	1 49 42.35	2.4691	14 24 32.2	10.478	15	3 53 55.83	2.6794	20 35 25.0	4.432
16	1 52 10.66	2.4747	14 34 58.2	10.388	16	3 56 36.66	2.6815	20 39 46.2	4.276
17	1 54 39.31	2.4802	14 45 18.7	10.296	17	3 59 17.61	2.6834	20 43 58.1	4.119
18	1 57 8.28	2.4858	14 55 33.7	10.203	18	4 1 58.67	2.6853	20 48 0.5	3.962
19	1 59 37.60	2.4913	15 5 43.1	10.108	19	4 4 39.84	2.6870	20 51 53.5	3.805
20	2 2 7.24	2.4968	15 15 46.7	10.012	20	4 7 21.11	2.6885	20 55 37.1	3.647
21	2 4 37.21	2.5023	15 25 44.5	9.914	21	4 10 2.46	2.6898	20 59 11.1	3.487
22	2 7 7.52	2.5078	15 35 36.4	9.814	22	4 12 43.89	2.6912	21 2 35.5	3.328
23	2 9 38.15	2.5133	15 45 22.2	9.712	23	4 15 25.40	2.6923	21 5 50.4	3.168
24	2 12 9.11	2.5188	+15 55 1.8	+ 9.608	24	4 18 6.97	2.6033	+21 8 55.6	+3.007

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 29.			
	h m s	s	° ′ ″	″
0	4 18 6.97	2.6933	+21 8 55.6	+3.007
1	4 20 48.60	2.6942	21 11 51.2	2.846
2	4 23 30.27	2.6948	21 14 37.1	2.684
3	4 26 11.98	2.6954	21 17 13.3	2.523
4	4 28 53.72	2.6958	21 19 39.8	2.361
5	4 31 35.47	2.6960	21 21 56.6	2.199
6	4 34 17.24	2.6962	21 24 3.7	2.037
7	4 36 59.01	2.6962	21 26 1.0	1.874
8	4 39 40.78	2.6960	21 27 48.6	1.712
9	4 42 22.53	2.6956	21 29 26.4	1.548
10	4 45 4.25	2.6951	21 30 54.4	1.385
11	4 47 45.94	2.6945	21 32 12.6	1.223
12	4 50 27.59	2.6938	21 33 21.1	1.060
13	4 53 9.19	2.6928	21 34 19.8	0.897
14	4 55 50.72	2.6917	21 35 8.7	0.733
15	4 58 32.19	2.6905	21 35 47.8	0.571
16	5 1 13.58	2.6891	21 36 17.2	0.403
17	5 3 54.88	2.6875	21 36 36.9	0.247
18	5 6 36.08	2.6858	21 36 46.8	+0.085
19	5 9 17.18	2.6841	21 36 47.1	−0.076
20	5 11 58.17	2.6822	21 36 37.7	0.238
21	5 14 39.04	2.6801	21 36 18.6	0.398
22	5 17 19.78	2.6778	21 35 49.9	0.559
23	5 20 0.38	2.6754	+21 35 11.5	−0.719
	MAY 30.			
0	5 22 40.83	2.6729	+21 34 23.6	−0.878
1	5 25 21.13	2.6703	21 33 26.1	1.038
2	5 28 1.26	2.6674	21 32 19.1	1.196
3	5 30 41.22	2.6644	21 31 2.6	1.353
4	5 33 20.99	2.6613	21 29 36.7	1.510
5	5 36 0.58	2.6582	21 28 1.4	1.667
6	5 38 39.97	2.6548	21 26 16.7	1.823
7	5 41 19.16	2.6513	21 24 22.7	1.977
8	5 43 58.13	2.6477	21 22 19.5	2.131
9	5 46 36.88	2.6440	21 20 7.0	2.285
10	5 49 15.41	2.6402	21 17 45.3	2.438
11	5 51 53.70	2.6362	21 15 14.5	2.589
12	5 54 31.75	2.6321	21 12 34.6	2.740
13	5 57 9.55	2.6279	21 9 45.7	2.889
14	5 59 47.10	2.6237	21 6 47.9	3.038
15	6 2 24.39	2.6192	21 3 41.1	3.187
16	6 5 1.40	2.6146	21 0 25.5	3.333
17	6 7 38.14	2.6100	20 57 1.2	3.478
18	6 10 14.60	2.6053	20 53 28.1	3.623
19	6 12 50.77	2.6003	20 49 46.4	3.767
20	6 15 26.64	2.5954	20 45 56.1	3.910
21	6 18 2.22	2.5903	20 41 57.2	4.051
22	6 20 37.48	2.5852	20 37 50.0	4.191
23	6 23 12.44	2.5800	20 33 34.3	4.331
24	6 25 47.08	2.5747	+20 29 10.3	−4.468

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 31.			
	h m s	s	° ′ ″	″
0	6 25 47.08	2.5747	+20 29 10.3	−4.468
1	6 28 21.40	2.5692	20 24 38.1	4.605
2	6 30 55.38	2.5637	20 19 57.7	4.740
3	6 33 29.04	2.5581	20 15 9.3	4.873
4	6 36 2.35	2.5524	20 10 12.9	5.007
5	6 38 35.33	2.5467	20 5 8.5	5.139
6	6 41 7.96	2.5408	19 59 56.2	5.268
7	6 43 40.23	2.5350	19 54 36.3	5.397
8	6 46 12.16	2.5291	19 49 8.6	5.525
9	6 48 43.72	2.5230	19 43 33.3	5.652
10	6 51 14.92	2.5170	19 37 50.4	5.777
11	6 53 45.76	2.5108	19 32 0.1	5.899
12	6 56 16.22	2.5046	19 26 2.5	6.021
13	6 58 46.31	2.4984	19 19 57.6	6.142
14	7 1 16.03	2.4922	19 13 45.5	6.261
15	7 3 45.37	2.4858	19 7 26.3	6.378
16	7 6 14.32	2.4793	19 1 0.1	6.495
17	7 8 42.89	2.4730	18 54 26.9	6.610
18	7 11 11.08	2.4666	18 47 46.9	6.723
19	7 13 38.88	2.4600	18 41 0.1	6.836
20	7 16 6.28	2.4534	18 34 6.6	6.946
21	7 18 33.29	2.4469	18 27 6.6	7.055
22	7 20 59.91	2.4403	18 20 0.0	7.163
23	7 23 26.13	2.4337	+18 12 47.1	−7.268
	JUNE 1.			
0	7 25 51.95	2.4270	+18 5 27.8	−7.373
1	7 28 17.37	2.4203	17 58 2.3	7.476
2	7 30 42.39	2.4137	17 50 30.7	7.578
3	7 33 7.01	2.4070	17 42 53.0	7.678
4	7 35 31.23	2.4003	17 35 9.3	7.777
5	7 37 55.05	2.3936	17 27 19.8	7.873
6	7 40 18.46	2.3868	17 19 24.5	7.969
7	7 42 41.46	2.3801	17 11 23.5	8.064
8	7 45 4.07	2.3733	17 3 16.8	8.157
9	7 47 26.26	2.3666	16 55 4.7	8.248
10	7 49 48.06	2.3599	16 46 47.1	8.338
11	7 52 9.45	2.3531	16 38 24.1	8.427
12	7 54 30.43	2.3463	16 29 55.9	8.513
13	7 56 51.01	2.3397	16 21 22.5	8.598
14	7 59 11.19	2.3330	16 12 44.1	8.682
15	8 1 30.97	2.3263	16 4 0.7	8.765
16	8 3 50.34	2.3196	15 55 12.3	8.847
17	8 6 9.32	2.3129	15 46 19.1	8.926
18	8 8 27.89	2.3062	15 37 21.2	9.003
19	8 10 46.06	2.2996	15 28 18.7	9.080
20	8 13 3.84	2.2930	15 19 11.6	9.156
21	8 15 21.22	2.2863	15 10 0.0	9.230
22	8 17 38.20	2.2797	15 0 44.0	9.303
23	8 19 54.78	2.2732	14 51 23.7	9.373
24	8 22 10.98	2.2667	+14 41 59.2	−9.[illegible]

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 2.					JUNE 4.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 22 10.98	2.2667	+14 41 59.2	− 9.443	0	10 4 17.67	2.0088	+6 12 35.6	−11.343
1	8 24 26.78	2.2602	14 32 30.6	9.511	1	10 6 18.08	2.0049	6 1 14.6	11.356
2	8 26 42.20	2.2538	14 22 57.9	9.578	2	10 8 18.26	2.0010	5 49 52.9	11.368
3	8 28 57.23	2.2473	14 13 21.2	9.643	3	10 10 18.20	1.9972	5 38 30.4	11.382
4	8 31 11.88	2.2409	14 3 40.7	9.708	4	10 12 17.92	1.9935	5 27 7.1	11.393
5	8 33 26.14	2.2345	13 53 56.3	9.771	5	10 14 17.42	1.9898	5 15 43.3	11.402
6	8 35 40.02	2.2283	13 44 8.2	9.833	6	10 16 16.70	1.9862	5 4 18.9	11.412
7	8 37 53.53	2.2220	13 34 16.4	9.893	7	10 18 15.76	1.9827	4 52 53.9	11.421
8	8 40 6.66	2.2157	13 24 21.1	9.951	8	10 20 14.62	1.9793	4 41 28.4	11.428
9	8 42 19.41	2.2095	13 14 22.3	10.009	9	10 22 13.27	1.9758	4 30 2.5	11.435
10	8 44 31.80	2.2033	13 4 20.0	10.065	10	10 24 11.72	1.9725	4 18 36.2	11.441
11	8 46 43.81	2.1972	12 54 14.4	10.121	11	10 26 9.97	1.9692	4 7 9.6	11.446
12	8 48 55.46	2.1912	12 44 5.5	10.174	12	10 28 8.02	1.9659	3 55 42.7	11.450
13	8 51 6.75	2.1851	12 33 53.5	10.227	13	10 30 5.88	1.9628	3 44 15.6	11.454
14	8 53 17.67	2.1791	12 23 38.3	10.278	14	10 32 3.56	1.9598	3 32 48.2	11.458
15	8 55 28.24	2.1733	12 13 20.1	10.328	15	10 34 1.05	1.9568	3 21 20.7	11.459
16	8 57 38.46	2.1673	12 2 59.0	10.377	16	10 35 58.37	1.9538	3 9 53.1	11.461
17	8 59 48.32	2.1615	11 52 34.9	10.424	17	10 37 55.51	1.9509	2 58 25.4	11.461
18	9 1 57.84	2.1558	11 42 8.1	10.469	18	10 39 52.48	1.9482	2 46 57.8	11.461
19	9 4 7.01	2.1500	11 31 38.6	10.515	19	10 41 49.29	1.9454	2 35 30.1	11.460
20	9 6 15.84	2.1443	11 21 6.3	10.559	20	10 43 45.93	1.9427	2 24 2.6	11.458
21	9 8 24.32	2.1387	11 10 31.5	10.601	21	10 45 42.41	1.9400	2 12 35.1	11.456
22	9 10 32.48	2.1331	10 59 54.2	10.643	22	10 47 38.73	1.9375	2 1 7.9	11.453
23	9 12 40.29	2.1275	+10 49 14.4	−10.683	23	10 49 34.91	1.9351	+1 49 40.8	−11.449
	JUNE 3.					JUNE 5.			
0	9 14 47.78	2.1221	+10 38 32.2	−10.723	0	10 51 30.94	1.9327	+1 38 14.0	−11.444
1	9 16 54.94	2.1167	10 27 47.7	10.760	1	10 53 26.83	1.9303	1 26 47.5	11.439
2	9 19 1.78	2.1113	10 17 1.0	10.797	2	10 55 22.57	1.9280	1 15 21.3	11.433
3	9 21 8.29	2.1059	10 6 12.1	10.833	3	10 57 18.19	1.9258	1 3 55.6	11.426
4	9 23 14.49	2.1008	9 55 21.1	10.868	4	10 59 13.66	1.9236	0 52 30.2	11.418
5	9 25 20.38	2.0955	9 44 28.0	10.901	5	11 1 9.02	1.9215	0 41 5.4	11.410
6	9 27 25.95	2.0904	9 33 33.0	10.933	6	11 3 4.24	1.9194	0 29 41.0	11.402
7	9 29 31.23	2.0854	9 22 36.1	10.964	7	11 4 59.35	1.9175	0 18 17.2	11.393
8	9 31 36.20	2.0803	9 11 37.3	10.994	8	11 6 54.34	1.9156	+0 6 53.9	11.383
9	9 33 40.87	2.0754	9 0 36.8	11.023	9	11 8 49.22	1.9137	−0 4 28.7	11.371
10	9 35 45.25	2.0705	8 49 34.5	11.053	10	11 10 43.98	1.9119	0 15 50.6	11.359
11	9 37 49.33	2.0657	8 38 30.5	11.079	11	11 12 38.65	1.9103	0 27 11.8	11.347
12	9 39 53.13	2.0610	8 27 25.0	11.105	12	11 14 33.21	1.9086	0 38 32.2	11.334
13	9 41 56.65	2.0563	8 16 17.9	11.130	13	11 16 27.68	1.9070	0 49 51.9	11.321
14	9 43 59.88	2.0516	8 5 9.4	11.154	14	11 18 22.05	1.9054	1 1 10.7	11.307
15	9 46 2.84	2.0471	7 53 59.4	11.178	15	11 20 16.33	1.9040	1 12 28.7	11.292
16	9 48 5.53	2.0426	7 42 48.1	11.199	16	11 22 10.53	1.9026	1 23 45.7	11.277
17	9 50 7.95	2.0381	7 31 35.5	11.221	17	11 24 4.64	1.9012	1 35 1.9	11.261
18	9 52 10.10	2.0337	7 20 21.6	11.241	18	11 25 58.67	1.8999	1 46 17.0	11.243
19	9 54 11.99	2.0293	7 9 6.6	11.260	19	11 27 52.63	1.8988	1 57 31.1	11.227
20	9 56 13.62	2.0252	6 57 50.4	11.278	20	11 29 46.52	1.8976	2 8 44.2	11.208
21	9 58 15.01	2.0210	6 46 33.2	11.296	21	11 31 40.34	1.8964	2 19 56.1	11.190
22	10 0 16.14	2.0168	6 35 14.9	11.313	22	11 33 34.09	1.8953	2 31 7.0	11.171
23	10 2 17.02	2.0128	6 23 55.7	11.328	23	11 35 27.78	1.8944	2 42 16.6	11.151
	10 4 17.67	2.0088	+ 6 12 35.6	−11.343	24	11 37 21.42	1.8935	−2 53 25.1	−11.131

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 6.					JUNE 8.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 37 21.42	1.8935	– 2 53 25.1	–11.131	0	13 8 14.23	1.9128	–11 13 4.8	–9.468
1	11 39 15.00	1.8927	3 4 32.3	11.110	1	13 10 9.04	1.9143	11 22 31.4	9.419
2	11 41 8.54	1.8918	3 15 38.3	11.088	2	13 12 3.94	1.9158	11 31 55.1	9.370
3	11 43 2.02	1.8911	3 26 42.9	11.066	3	13 13 58.94	1.9175	11 41 15.8	9.320
4	11 44 55.47	1.8904	3 37 46.2	11.044	4	13 15 54.04	1.9192	11 50 33.5	9.269
5	11 46 48.87	1.8898	3 48 48.2	11.020	5	13 17 49.24	1.9209	11 59 48.1	9.218
6	11 48 42.24	1.8893	3 59 48.6	10.996	6	13 19 44.55	1.9227	12 8 59.7	9.168
7	11 50 35.58	1.8887	4 10 47.7	10.972	7	13 21 39.96	1.9244	12 18 8.2	9.115
8	11 52 28.88	1.8882	4 21 45.2	10.946	8	13 23 35.48	1.9262	12 27 13.5	9.063
9	11 54 22.16	1.8878	4 32 41.2	10.921	9	13 25 31.10	1.9280	12 36 15.7	9.009
10	11 56 15.42	1.8875	4 43 35.7	10.894	10	13 27 26.84	1.9300	12 45 14.6	8.955
11	11 58 8.66	1.8873	4 54 28.5	10.867	11	13 29 22.70	1.9319	12 54 10.3	8.901
12	12 0 1.89	1.8870	5 5 19.7	10.839	12	13 31 18.67	1.9338	13 3 2.7	8.846
13	12 1 55.10	1.8868	5 16 9.2	10.812	13	13 33 14.76	1.9358	13 11 51.8	8.790
14	12 3 48.31	1.8868	5 26 57.1	10.783	14	13 35 10.97	1.9378	13 20 37.5	8.734
15	12 5 41.51	1.8866	5 37 43.2	10.753	15	13 37 7.30	1.9398	13 29 19.9	8.678
16	12 7 34.70	1.8866	5 48 27.5	10.723	16	13 39 3.75	1.9419	13 37 58.8	8.620
17	12 9 27.90	1.8867	5 59 10.0	10.693	17	13 41 0.33	1.9441	13 46 34.3	8.563
18	12 11 21.10	1.8868	6 9 50.7	10.663	18	13 42 57.04	1.9463	13 55 6.3	8.503
19	12 13 14.31	1.8869	6 20 29.5	10.631	19	13 44 53.88	1.9483	14 3 34.7	8.444
20	12 15 7.53	1.8872	6 31 6.4	10.599	20	13 46 50.84	1.9506	14 11 59.6	8.385
21	12 17 0.77	1.8874	6 41 41.4	10.567	21	13 48 47.95	1.9528	14 20 20.9	8.324
22	12 18 54.02	1.8877	6 52 14.4	10.533	22	13 50 45.18	1.9550	14 28 33.5	8.263
23	12 20 47.29	1.8880	– 7 2 45.3	–10.498	23	13 52 42.55	1.9573	–14 36 52.5	–8.202
	JUNE 7.					JUNE 9.			
0	12 22 40.58	1.8884	– 7 13 14.2	–10.464	0	13 54 40.06	1.9597	–14 45 2.7	–8.139
1	12 24 33.90	1.8888	7 23 41.0	10.429	1	13 56 37.71	1.9619	14 53 9.2	8.078
2	12 26 27.25	1.8894	7 34 5.7	10.394	2	13 58 35.49	1.9643	15 1 12.0	8.014
3	12 28 20.63	1.8900	7 44 28.3	10.358	3	14 0 33.42	1.9667	15 9 10.9	7.950
4	12 30 14.05	1.8907	7 54 48.7	10.321	4	14 2 31.49	1.9691	15 17 6.0	7.886
5	12 32 7.51	1.8913	8 5 6.8	10.283	5	14 4 29.71	1.9715	15 24 57.2	7.821
6	12 34 1.00	1.8920	8 15 22.7	10.247	6	14 6 28.07	1.9739	15 32 44.5	7.755
7	12 35 54.55	1.8928	8 25 36.4	10.208	7	14 8 26.58	1.9763	15 40 27.8	7.689
8	12 37 48.14	1.8935	8 35 47.7	10.168	8	14 10 25.23	1.9788	15 48 7.2	7.623
9	12 39 41.77	1.8944	8 45 56.6	10.129	9	14 12 24.04	1.9813	15 55 42.5	7.555
10	12 41 35.47	1.8954	8 56 3.2	10.089	10	14 14 22.99	1.9838	16 3 13.8	7.488
11	12 43 29.22	1.8963	9 6 7.3	10.048	11	14 16 22.10	1.9864	16 10 41.0	7.418
12	12 45 23.02	1.8973	9 16 9.0	10.008	12	14 18 21.36	1.9889	16 18 4.0	7.349
13	12 47 16.89	1.8983	9 26 8.2	9.965	13	14 20 20.77	1.9915	16 25 22.9	7.280
14	12 49 10.82	1.8993	9 36 4.8	9.923	14	14 22 20.34	1.9941	16 32 37.6	7.209
15	12 51 4.81	1.9005	9 45 58.9	9.880	15	14 24 20.06	1.9967	16 39 48.0	7.138
16	12 52 58.88	1.9018	9 55 50.4	9.836	16	14 26 19.94	1.9993	16 46 54.2	7.068
17	12 54 53.02	1.9029	10 5 39.2	9.792	17	14 28 19.97	2.0018	16 53 56.1	6.995
18	12 56 47.23	1.9042	10 15 25.4	9.748	18	14 30 20.16	2.0045	17 0 53.6	6.923
19	12 58 41.52	1.9055	10 25 9.0	9.703	19	14 32 20.51	2.0072	17 7 46.8	6.849
20	13 0 35.89	1.9069	10 34 49.7	9.656	20	14 34 21.02	2.0098	17 14 35.5	6.775
21	13 2 30.35	1.9083	10 44 27.7	9.610	21	14 36 21.68	2.0123	17 21 19.8	6.701
22	13 4 24.89	1.9097	10 54 2.9	9.563	22	14 38 22.50	2.0151	17 27 59.6	6.626
23	13 6 19.51	1.9112	11 3 35.3	9.516	23	14 40 23.49	2.0178	17 34 34.9	6.550
24	13 8 14.23	1.9128	–11 13 4.8	– 9.468	24	14 42 24.63	2.0204	–17 41 5.6	

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 10.			
	h m s	s	° ′ ″	″
0	14 42 24.63	2.0204	−17 41 5.6	−6.473
1	14 44 25.94	2.0231	17 47 31.7	6.398
2	14 46 27.40	2.0258	17 53 53.3	6.320
3	14 48 29.03	2.0285	18 0 10.1	6.242
4	14 50 30.82	2.0311	18 6 22.3	6.164
5	14 52 32.76	2.0338	18 12 29.8	6.085
6	14 54 34.87	2.0365	18 18 32.5	6.005
7	14 56 37.14	2.0392	18 24 30.4	5.924
8	14 58 39.57	2.0418	18 30 23.4	5.843
9	15 0 42.16	2.0445	18 36 11.6	5.763
10	15 2 44.91	2.0472	18 41 55.0	5.682
11	15 4 47.82	2.0498	18 47 33.4	5.598
12	15 6 50.89	2.0525	18 53 6.8	5.516
13	15 8 54.12	2.0553	18 58 35.3	5.433
14	15 10 57.52	2.0579	19 3 58.7	5.348
15	15 13 1.07	2.0605	19 9 17.0	5.263
16	15 15 4.78	2.0632	19 14 30.3	5.179
17	15 17 8.65	2.0658	19 19 38.5	5.093
18	15 19 12.67	2.0683	19 24 41.4	5.006
19	15 21 16.85	2.0710	19 29 39.2	4.920
20	15 23 21.19	2.0736	19 34 31.8	4.833
21	15 25 25.68	2.0762	19 39 19.1	4.745
22	15 27 30.33	2.0788	19 44 1.2	4.657
23	15 29 35.13	2.0813	−19 48 37.9	−4.568
	JUNE 11.			
0	15 31 40.08	2.0838	−19 53 9.3	−4.478
1	15 33 45.19	2.0863	19 57 35.3	4.388
2	15 35 50.44	2.0888	20 1 55.9	4.298
3	15 37 55.85	2.0913	20 6 11.1	4.208
4	15 40 1.40	2.0938	20 10 20.8	4.116
5	15 42 7.10	2.0963	20 14 25.0	4.024
6	15 44 12.95	2.0987	20 18 23.7	3.932
7	15 46 18.94	2.1011	20 22 16.8	3.839
8	15 48 25.08	2.1034	20 26 4.4	3.747
9	15 50 31.35	2.1058	20 29 46.4	3.653
10	15 52 37.77	2.1082	20 33 22.7	3.558
11	15 54 44.33	2.1104	20 36 53.3	3.463
12	15 56 51.02	2.1127	20 40 18.3	3.369
13	15 58 57.85	2.1149	20 43 37.6	3.273
14	16 1 4.81	2.1172	20 46 51.1	3.177
15	16 3 11.91	2.1194	20 49 58.8	3.081
16	16 5 19.14	2.1215	20 53 0.8	2.984
17	16 7 26.49	2.1236	20 55 56.9	2.887
18	16 9 33.97	2.1258	20 58 47.2	2.790
19	16 11 41.58	2.1278	21 1 31.7	2.692
20	16 13 49.31	2.1298	21 4 10.2	2.593
21	16 15 57.16	2.1318	21 6 42.9	2.495
22	16 18 5.13	2.1338	21 9 9.6	2.395
23	16 20 13.22	2.1358	21 11 30.3	2.296
24	16 22 21.42	2.1377	−21 13 45.1	−2.197

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 12.			
	h m s	s	° ′ ″	″
0	16 22 21.42	2.1377	−21 13 45.1	−2.197
1	16 24 29.74	2.1395	21 15 53.9	2.096
2	16 26 38.16	2.1413	21 17 56.6	1.995
3	16 28 46.69	2.1431	21 19 53.3	1.894
4	16 30 55.33	2.1449	21 21 43.9	1.793
5	16 33 4.08	2.1466	21 23 28.5	1.693
6	16 35 12.92	2.1483	21 25 7.0	1.590
7	16 37 21.87	2.1499	21 26 39.3	1.488
8	16 39 30.91	2.1514	21 28 5.6	1.386
9	16 41 40.04	2.1530	21 29 25.6	1.283
10	16 43 49.27	2.1546	21 30 39.5	1.181
11	16 45 58.59	2.1560	21 31 47.3	1.078
12	16 48 7.99	2.1574	21 32 48.8	0.973
13	16 50 17.48	2.1588	21 33 44.1	0.870
14	16 52 27.05	2.1602	21 34 33.2	0.767
15	16 54 36.70	2.1615	21 35 16.1	0.663
16	16 56 46.43	2.1628	21 35 52.7	0.558
17	16 58 56.23	2.1639	21 36 23.1	0.454
18	17 1 6.10	2.1651	21 36 47.2	0.349
19	17 3 16.04	2.1663	21 37 5.0	0.244
20	17 5 26.05	2.1673	21 37 16.5	0.139
21	17 7 36.12	2.1683	21 37 21.7	−0.033
22	17 9 46.25	2.1603	21 37 20.5	+0.072
23	17 11 56.44	2.1703	−21 37 13.1	+0.177
	JUNE 13.			
0	17 14 6.68	2.1712	−21 36 59.3	+0.283
1	17 16 16.98	2.1720	21 36 39.2	0.388
2	17 18 27.32	2.1728	21 36 12.8	0.493
3	17 20 37.72	2.1736	21 35 40.0	0.600
4	17 22 48.15	2.1743	21 35 0.8	0.706
5	17 24 58.63	2.1750	21 34 15.3	0.812
6	17 27 9.15	2.1756	21 33 23.4	0.918
7	17 29 19.70	2.1761	21 32 25.1	1.024
8	17 31 30.28	2.1767	21 31 20.5	1.130
9	17 33 40.90	2.1772	21 30 9.5	1.237
10	17 35 51.54	2.1775	21 28 52.1	1.343
11	17 38 2.20	2.1779	21 27 28.3	1.450
12	17 40 12.89	2.1783	21 25 58.1	1.556
13	17 42 23.60	2.1786	21 24 21.6	1.662
14	17 44 34.32	2.1788	21 22 38.7	1.768
15	17 46 45.06	2.1791	21 20 49.4	1.875
16	17 48 55.81	2.1792	21 18 53.7	1.981
17	17 51 6.56	2.1793	21 16 51.7	2.087
18	17 53 17.32	2.1794	21 14 43.3	2.193
19	17 55 28.09	2.1794	21 12 28.6	2.298
20	17 57 38.85	2.1793	21 10 7.5	2.405
21	17 59 49.61	2.1793	21 7 40.0	2.511
22	18 2 0.37	2.1792	21 5 6.2	2.616
23	18 4 11.11	2.1790	21 2 26.1	2.721
24	18 6 21.85	2.1789	−20 59 39.7	+2.826

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 14.					JUNE 16.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 6 21.85	2.1780	−20 59 39.7	+2.826	0	19 50 3.06	2.1314	−16 47 42.3	+ 7.523
1	18 8 32.58	2.1787	20 56 47.0	2.932	1	19 52 10.90	2.1300	16 40 8.3	7.610
2	18 10 43.29	2.1783	20 53 47.9	3.038	2	19 54 18.66	2.1285	16 32 29.1	7.696
3	18 12 53.98	2.1780	20 50 42.5	3.142	3	19 56 26.32	2.1271	16 24 44.8	7.782
4	18 15 4.65	2.1776	20 47 30.9	3.246	4	19 58 33.91	2.1257	16 16 55.3	7.867
5	18 17 15.29	2.1773	20 44 13.0	3.351	5	20 0 41.40	2.1242	16 9 0.8	7.951
6	18 19 25.92	2.1768	20 40 48.8	3.455	6	20 2 48.81	2.1228	16 1 1.2	8.034
7	18 21 36.51	2.1763	20 37 18.4	3.559	7	20 4 56.13	2.1213	15 52 56.7	8.117
8	18 23 47.07	2.1758	20 33 41.7	3.663	8	20 7 3.36	2.1198	15 44 47.2	8.200
9	18 25 57.61	2.1753	20 29 58.8	3.767	9	20 9 10.51	2.1184	15 36 32.7	8.283
10	18 28 8.10	2.1746	20 26 9.7	3.870	10	20 11 17.57	2.1170	15 28 13.3	8.363
11	18 30 18.56	2.1740	20 22 14.4	3.973	11	20 13 24.55	2.1156	15 19 49.1	8.443
12	18 32 28.98	2.1733	20 18 12.9	4.077	12	20 15 31.44	2.1142	15 11 20.1	8.523
13	18 34 39.36	2.1726	20 14 5.2	4.179	13	20 17 38.25	2.1128	15 2 46.3	8.603
14	18 36 49.69	2.1718	20 9 51.4	4.281	14	20 19 44.97	2.1113	14 54 7.8	8.681
15	18 38 59.98	2.1711	20 5 31.5	4.383	15	20 21 51.60	2.1099	14 45 24.6	8.759
16	18 41 10.22	2.1703	20 1 5.5	4.485	16	20 23 58.16	2.1086	14 36 36.7	8.837
17	18 43 20.41	2.1694	19 56 33.3	4.587	17	20 26 4.63	2.1072	14 27 44.2	8.913
18	18 45 30.55	2.1686	19 51 55.1	4.687	18	20 28 11.02	2.1058	14 18 47.1	8.989
19	18 47 40.64	2.1677	19 47 10.9	4.788	19	20 30 17.33	2.1045	14 9 45.5	9.065
20	18 49 50.67	2.1667	19 42 20.6	4.888	20	20 32 23.56	2.1032	14 0 39.3	9.140
21	18 52 0.64	2.1658	19 37 24.3	4.988	21	20 34 29.71	2.1018	13 51 28.7	9.213
22	18 54 10.56	2.1648	19 32 22.0	5.088	22	20 36 35.78	2.1005	13 42 13.7	9.286
23	18 56 20.42	2.1638	−19 27 13.7	+5.188	23	20 38 41.77	2.0993	−13 32 54.4	+ 9.358
	JUNE 15.					JUNE 17.			
0	18 58 30.21	2.1627	−19 21 59.5	+5.286	0	20 40 47.69	2.0980	−13 23 30.7	+ 9.431
1	19 0 39.94	2.1616	19 16 39.4	5.385	1	20 42 53.53	2.0968	13 14 2.7	9.502
2	19 2 49.60	2.1604	19 11 13.3	5.483	2	20 44 59.30	2.0956	13 4 30.5	9.573
3	19 4 59.19	2.1593	19 5 41.4	5.581	3	20 47 5.00	2.0943	12 54 54.0	9.643
4	19 7 8.72	2.1583	19 0 3.6	5.678	4	20 49 10.62	2.0932	12 45 13.4	9.711
5	19 9 18.18	2.1570	18 54 20.0	5.775	5	20 51 16.18	2.0920	12 35 28.7	9.779
6	19 11 27.56	2.1558	18 48 30.6	5.872	6	20 53 21.66	2.0908	12 25 39.9	9.847
7	19 13 36.87	2.1546	18 42 35.4	5.968	7	20 55 27.08	2.0898	12 15 47.1	9.913
8	19 15 46.11	2.1533	18 36 34.5	6.063	8	20 57 32.43	2.0887	12 5 50.3	9.980
9	19 17 55.27	2.1521	18 30 27.9	6.158	9	20 59 37.72	2.0877	11 55 49.5	10.045
10	19 20 4.36	2.1508	18 24 15.6	6.253	10	21 1 42.95	2.0867	11 45 44.9	10.109
11	19 22 13.37	2.1495	18 17 57.6	6.347	11	21 3 48.12	2.0856	11 35 36.4	10.173
12	19 24 22.30	2.1482	18 11 34.0	6.440	12	21 5 53.22	2.0846	11 25 24.1	10.237
13	19 26 31.15	2.1469	18 5 4.8	6.533	13	21 7 58.27	2.0837	11 15 8.0	10.298
14	19 28 39.93	2.1456	17 58 30.0	6.627	14	21 10 3.26	2.0828	11 4 48.3	10.360
15	19 30 48.62	2.1442	17 51 49.6	6.718	15	21 12 8.20	2.0819	10 54 24.8	10.422
16	19 32 57.23	2.1428	17 45 3.8	6.810	16	21 14 13.09	2.0810	10 43 57.7	10.481
17	19 35 5.75	2.1414	17 38 12.4	6.902	17	21 16 17.92	2.0802	10 33 27.1	10.540
18	19 37 14.20	2.1400	17 31 15.6	6.992	18	21 18 22.71	2.0795	10 22 52.9	10.599
19	19 39 22.55	2.1386	17 24 13.4	7.082	19	21 20 27.46	2.0788	10 12 15.2	10.657
20	19 41 30.83	2.1373	17 17 5.8	7.171	20	21 22 32.16	2.0780	10 1 34.1	10.713
21	19 43 39.02	2.1358	17 9 52.9	7.259	21	21 24 36.82	2.0773	9 50 49.6	10.770
22	19 45 47.12	2.1343	17 2 34.7	7.348	22	21 26 41.44	2.0767	9 40 1.7	10.826
23	19 47 55.13	2.1328	16 55 11.1	7.437	23	21 28 46.02	2.0761	9 29 10.5	10.880
24	19 50 3.06	2.1314	−16 47 42.3	+7.523	24	21 30 50.57	2.0756	− 9 18 16.1	+10.933

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 18.					JUNE 20.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 30 50.57	2.0756	−9 18 16.1	+10.933	0	23 10 42.03	2.1055	+ 0 12 32.1	+12.505
1	21 32 55.09	2.0750	9 7 18.5	10.987	1	23 12 48.42	2.1074	0 25 2.7	12.515
2	21 34 59.57	2.0745	8 56 17.7	11.039	2	23 14 54.92	2.1094	0 37 33.9	12.523
3	21 37 4.03	2.0742	8 45 13.8	11.090	3	23 17 1.55	2.1116	0 50 5.5	12.531
4	21 39 8.47	2.0738	8 34 6.9	11.141	4	23 19 8.31	2.1138	1 2 37.6	12.538
5	21 41 12.88	2.0733	8 22 56.9	11.191	5	23 21 15.21	2.1161	1 15 10.0	12.543
6	21 43 17.27	2.0730	8 11 44.0	11.240	6	23 23 22.24	2.1183	1 27 42.8	12.548
7	21 45 21.64	2.0728	8 0 28.1	11.288	7	23 25 29.41	2.1207	1 40 15.7	12.551
8	21 47 26.00	2.0726	7 49 9.4	11.335	8	23 27 36.72	2.1231	1 52 48.9	12.554
9	21 49 30.35	2.0723	7 37 47.9	11.382	9	23 29 44.18	2.1256	2 5 22.2	12.555
10	21 51 34.68	2.0722	7 26 23.6	11.428	10	23 31 51.79	2.1282	2 17 55.5	12.555
11	21 53 39.01	2.0721	7 14 56.6	11.473	11	23 33 59.56	2.1308	2 30 28.8	12.555
12	21 55 43.33	2.0720	7 3 26.9	11.517	12	23 36 7.48	2.1334	2 43 2.0	12.552
13	21 57 47.65	2.0721	6 51 54.6	11.559	13	23 38 15.57	2.1360	2 55 35.0	12.549
14	21 59 51.98	2.0721	6 40 19.8	11.601	14	23 40 23.82	2.1389	3 8 7.9	12.545
15	22 1 56.30	2.0722	6 28 42.5	11.643	15	23 42 32.24	2.1418	3 20 40.4	12.539
16	22 4 0.64	2.0723	6 17 2.7	11.684	16	23 44 40.84	2.1448	3 33 12.6	12.533
17	22 6 4.98	2.0725	6 5 20.4	11.724	17	23 46 49.61	2.1477	3 45 44.4	12.525
18	22 8 9.34	2.0728	5 53 35.8	11.763	18	23 48 58.56	2.1508	3 58 15.6	12.516
19	22 10 13.71	2.0731	5 41 48.9	11.800	19	23 51 7.70	2.1538	4 10 46.3	12.507
20	22 12 18.11	2.0734	5 29 59.8	11.838	20	23 53 17.02	2.1570	4 23 16.4	12.496
21	22 14 22.52	2.0738	5 18 8.4	11.874	21	23 55 26.54	2.1603	4 35 45.8	12.483
22	22 16 26.96	2.0743	5 6 14.9	11.909	22	23 57 36.25	2.1635	4 48 14.4	12.469
23	22 18 31.43	2.0748	−4 54 19.3	+11.944	23	23 59 46.16	2.1668	+ 5 0 42.1	+12.455
	JUNE 19.					JUNE 21.			
0	22 20 35.93	2.0753	−4 42 21.6	+11.978	0	0 1 56.27	2.1703	+ 5 13 9.0	+12.439
1	22 22 40.46	2.0759	4 30 22.0	12.010	1	0 4 6.59	2.1738	5 25 34.8	12.422
2	22 24 45.04	2.0766	4 18 20.4	12.043	2	0 6 17.12	2.1773	5 37 59.6	12.404
3	22 26 49.65	2.0773	4 6 16.9	12.073	3	0 8 27.86	2.1808	5 50 23.3	12.384
4	22 28 54.31	2.0780	3 54 11.6	12.103	4	0 10 38.82	2.1845	6 2 45.7	12.363
5	22 30 59.01	2.0788	3 42 4.5	12.133	5	0 12 50.00	2.1882	6 15 6.9	12.342
6	22 33 3.76	2.0798	3 29 55.7	12.161	6	0 15 1.40	2.1919	6 27 26.7	12.318
7	22 35 8.58	2.0808	3 17 45.2	12.188	7	0 17 13.03	2.1958	6 39 45.0	12.293
8	22 37 13.45	2.0817	3 5 33.2	12.214	8	0 19 24.89	2.1996	6 52 1.9	12.268
9	22 39 18.38	2.0827	2 53 19.5	12.240	9	0 21 36.98	2.2035	7 4 17.2	12.241
10	22 41 23.37	2.0838	2 41 4.4	12.564	10	0 23 49.31	2.2075	7 16 30.8	12.213
11	22 43 28.44	2.0850	2 28 47.8	12.288	11	0 26 1.88	2.2116	7 28 42.7	12.183
12	22 45 33.57	2.0862	2 16 29.9	12.309	12	0 28 14.70	2.2157	7 40 52.8	12.153
13	22 47 38.78	2.0875	2 4 10.7	12.332	13	0 30 27.76	2.2198	7 53 1.0	12.120
14	22 49 44.07	2.0888	1 51 50.1	12.353	14	0 32 41.08	2.2241	8 5 7.2	12.087
15	22 51 49.43	2.0902	1 39 28.4	12.372	15	0 34 54.65	2.2283	8 17 11.4	12.052
16	22 53 54.89	2.0917	1 27 5.5	12.391	16	0 37 8.47	2.2326	8 29 13.4	12.016
17	22 56 0.43	2.0932	1 14 41.5	12.408	17	0 39 22.56	2.2369	8 41 13.3	11.978
18	22 58 6.07	2.0948	1 2 16.5	12.425	18	0 41 36.90	2.2413	8 53 10.8	11.939
19	23 0 11.80	2.0963	0 49 50.5	12.441	19	0 43 51.52	2.2458	9 5 6.0	11.900
20	23 2 17.63	2.0981	0 37 23.6	12.456	20	0 46 6.40	2.2503	9 16 58.8	11.858
21	23 4 23.57	2.0998	0 24 55.8	12.470	21	0 48 21.56	2.2549	9 28 49.0	11.815
22	23 6 29.61	2.1016	−0 12 27.2	12.483	22	0 50 36.99	2.2594	9 40 36.6	11.771
23	23 8 35.76	2.1035	+0 0 2.1	12.494	23	0 52 52.69	2.2641	9 52 21.5	11.725
24	23 10 42.03	2.1055	+0 12 32.1	+12.505	24	0 55 8.68	2.2688	+10 4 3.6	+11.678

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min	Declination.	Var. per Min.
	JUNE 22.					JUNE 24.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 55 8.68	2.2688	+10 4 3.6	+11.678	0	2 49 59.86	2.5193	+18 2 45.1	+7.697
1	0 57 24.95	2.2736	10 15 42.9	11.630	1	2 52 31.17	2.5243	18 10 23.4	7.578
2	0 59 41.51	2.2783	10 27 19.2	11.580	2	2 55 2.77	2.5292	18 17 54.4	7.458
3	1 1 58.35	2.2832	10 38 52.5	11.528	3	2 57 34.67	2.5341	18 25 18.3	7.336
4	1 4 15.49	2.2881	10 50 22.6	11.476	4	3 0 6.86	2.5388	18 32 34.7	7.213
5	1 6 32.92	2.2930	11 1 49.6	11.423	5	3 2 39.33	2.5436	18 39 43.8	7.089
6	1 8 50.65	2.2979	11 13 13.3	11.367	6	3 5 12.09	2.5483	18 46 45.4	6.963
7	1 11 8.67	2.3029	11 24 33.6	11.309	7	3 7 45.12	2.5529	18 53 39.4	6.836
8	1 13 26.99	2.3079	11 35 50.4	11.251	8	3 10 18.44	2.5575	19 0 25.7	6.708
9	1 15 45.62	2.3130	11 47 3.7	11.191	9	3 12 52.02	2.5619	19 7 4.3	6.578
10	1 18 4.55	2.3181	11 58 13.3	11.130	10	3 15 25.87	2.5663	19 13 35.1	6.448
11	1 20 23.79	2.3232	12 9 19.3	11.068	11	3 17 59.98	2.5707	19 19 58.1	6.317
12	1 22 43.33	2.3283	12 20 21.4	11.003	12	3 20 34.35	2.5749	19 26 13.1	6.183
13	1 25 3.18	2.3335	12 31 19.6	10.938	13	3 23 8.97	2.5792	19 32 20.1	6.048
14	1 27 23.35	2.3388	12 42 13.9	10.870	14	3 25 43.85	2.5833	19 38 18.9	5.913
15	1 29 43.83	2.3440	12 53 4.0	10.801	15	3 28 18.96	2.5873	19 44 9.7	5.777
16	1 32 4.63	2.3493	13 3 50.0	10.731	16	3 30 54.32	2.5913	19 49 52.1	5.638
17	1 34 25.74	2.3545	13 14 31.7	10.659	17	3 33 29.91	2.5951	19 55 26.3	5.500
18	1 36 47.17	2.3598	13 25 9.1	10.587	18	3 36 5.73	2.5988	20 0 52.1	5.360
19	1 39 8.92	2.3652	13 35 42.1	10.512	19	3 38 41.77	2.6024	20 6 9.5	5.220
20	1 41 30.99	2.3705	13 46 10.5	10.436	20	3 41 18.02	2.6060	20 11 18.5	5.078
21	1 43 53.38	2.3758	13 56 34.4	10.358	21	3 43 54.49	2.6095	20 16 18.8	4.934
22	1 46 16.09	2.3812	14 6 53.5	10.278	22	3 46 31.16	2.6129	20 21 10.6	4.791
23	1 48 39.12	2.3866	+14 17 7.8	+10.198	23	3 49 8.04	2.6162	+20 25 53.7	+4.646
	JUNE 23.					JUNE 25.			
0	1 51 2.48	2.3921	+14 27 17.3	+10.117	0	3 51 45.10	2.6193	+20 30 28.1	+4.500
1	1 53 26.17	2.3974	14 37 21.8	10.033	1	3 54 22.35	2.6224	20 34 53.7	4.353
2	1 55 50.17	2.4028	14 47 21.2	9.947	2	3 56 59.79	2.6253	20 39 10.5	4.206
3	1 58 14.51	2.4083	14 57 15.4	9.860	3	3 59 37.39	2.6281	20 43 18.4	4.057
4	2 0 39.17	2.4137	15 7 4.4	9.773	4	4 2 15.16	2.6308	20 47 17.3	3.908
5	2 3 4.15	2.4191	15 16 48.1	9.683	5	4 4 53.09	2.6335	20 51 7.3	3.758
6	2 5 29.46	2.4246	15 26 26.4	9.592	6	4 7 31.18	2.6360	20 54 48.3	3.608
7	2 7 55.10	2.4300	15 35 59.1	9.498	7	4 10 9.41	2.6383	20 58 20.2	3.456
8	2 10 21.06	2.4353	15 45 26.2	9.405	8	4 12 47.78	2.6406	21 1 43.0	3.304
9	2 12 47.34	2.4408	15 54 47.7	9.309	9	4 15 26.28	2.6428	21 4 56.7	3.152
10	2 15 13.95	2.4463	16 4 3.3	9.212	10	4 18 4.91	2.6448	21 8 1.2	2.998
11	2 17 40.89	2.4516	16 13 13.1	9.113	11	4 20 43.65	2.6466	21 10 56.5	2.844
12	2 20 8.14	2.4569	16 22 16.9	9.013	12	4 23 22.50	2.6483	21 13 42.5	2.690
13	2 22 35.72	2.4623	16 31 14.7	8.912	13	4 26 1.45	2.6500	21 16 19.3	2.535
14	2 25 3.61	2.4676	16 40 6.3	8.808	14	4 28 40.50	2.6515	21 18 46.7	2.379
15	2 27 31.83	2.4729	16 48 51.6	8.703	15	4 31 19.63	2.6528	21 21 4.8	2.224
16	2 30 0.36	2.4782	16 57 30.7	8.598	16	4 33 58.84	2.6541	21 23 13.6	2.068
17	2 32 29.21	2.4835	17 6 3.3	8.490	17	4 36 38.12	2.6552	21 25 13.0	1.911
18	2 34 58.38	2.4888	17 14 29.5	8.381	18	4 39 17.46	2.6561	21 27 2.9	1.754
19	2 37 27.86	2.4938	17 22 49.0	8.270	19	4 41 56.85	2.6569	21 28 43.5	1.598
20	2 39 57.64	2.4990	17 31 1.9	8.159	20	4 44 36.29	2.6577	21 30 14.6	1.440
21	2 42 27.74	2.5042	17 39 8.1	8.046	21	4 47 15.77	2.6582	21 31 36.3	1.282
22	2 44 58.14	2.5093	17 47 7.4	7.930	22	4 49 55.27	2.6586	21 32 48.4	1.124
23	2 47 28.85	2.5143	17 54 59.7	7.814	23	4 52 34.80	2.6589	21 33 51.2	0.967
24	2 49 59.86	2.5193	+18 2 45.1	+7.697	24	4 55 14.34	2.6590	+21 34 44.4	+0.80[illegible]

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 26.					JUNE 28.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 55 14.34	2.6590	+21 34 44.4	+0.808	0	7 0 31.13	2.5162	+19 17 48.3	− 6.228
1	4 57 53.88	2.6590	21 35 28.1	0.650	1	7 3 1.94	2.5107	19 11 30.9	6.352
2	5 0 33.42	2.6589	21 36 2.4	0.492	2	7 5 32.41	2.5052	19 5 6.1	6.473
3	5 3 12.95	2.6586	21 36 27.1	0.333	3	7 8 2.56	2.4997	18 58 34.1	6.593
4	5 5 52.45	2.6582	21 36 42.4	0.175	4	7 10 32.37	2.4940	18 51 55.0	6.712
5	5 8 31.93	2.6577	21 36 48.1	+0.017	5	7 13 1.84	2.4883	18 45 8.7	6.829
6	5 11 11.37	2.6569	21 36 44.4	−0.141	6	7 15 30.97	2.4826	18 38 15.5	6.945
7	5 13 50.76	2.6561	21 36 31.2	0.299	7	7 17 59.75	2.4768	18 31 15.3	7.060
8	5 16 30.10	2.6552	21 36 8.5	0.457	8	7 20 28.19	2.4710	18 24 8.3	7.173
9	5 19 9.38	2.6541	21 35 36.4	0.614	9	7 22 56.27	2.4651	18 16 54.6	7.284
10	5 21 48.59	2.6528	21 34 54.8	0.772	10	7 25 24.00	2.4592	18 9 34.2	7.395
11	5 24 27.72	2.6514	21 34 3.8	0.928	11	7 27 51.37	2.4533	18 2 7.2	7.504
12	5 27 6.76	2.6499	21 33 3.4	1.085	12	7 30 18.39	2.4473	17 54 33.7	7.612
13	5 29 45.71	2.6483	21 31 53.6	1.241	13	7 32 45.05	2.4413	17 46 53.8	7.717
14	5 32 24.55	2.6464	21 30 34.5	1.397	14	7 35 11.34	2.4352	17 39 7.7	7.821
15	5 35 3.28	2.6445	21 29 6.0	1.553	15	7 37 37.27	2.4292	17 31 15.3	7.925
16	5 37 41.89	2.6424	21 27 28.2	1.708	16	7 40 2.84	2.4231	17 23 16.7	8.026
17	5 40 20.37	2.6403	21 25 41.1	1.862	17	7 42 28.04	2.4168	17 15 12.2	8.126
18	5 42 58.72	2.6379	21 23 44.8	2.015	18	7 44 52.86	2.4107	17 7 1.6	8.225
19	5 45 36.92	2.6355	21 21 39.3	2.168	19	7 47 17.32	2.4046	16 58 45.2	8.322
20	5 48 14.98	2.6330	21 19 24.6	2.322	20	7 49 41.41	2.3983	16 50 23.0	8.417
21	5 50 52.88	2.6303	21 17 0.7	2.474	21	7 52 5.12	2.3921	16 41 55.2	8.511
22	5 53 30.61	2.6273	21 14 27.7	2.625	22	7 54 28.46	2.3859	16 33 21.7	8.604
23	5 56 8.16	2.6244	+21 11 45.7	−2.775	23	7 56 51.43	2.3797	+16 24 42.7	− 8.696
	JUNE 27.					JUNE 29.			
0	5 58 45.54	2.6214	+21 8 54.7	−2.925	0	7 59 14.02	2.3734	+16 15 58.2	− 8.785
1	6 1 22.73	2.6182	21 5 54.7	3.074	1	8 1 36.24	2.3672	16 7 8.5	8.873
2	6 3 59.72	2.6148	21 2 45.8	3.223	2	8 3 58.08	2.3609	15 58 13.5	8.960
3	6 6 36.51	2.6114	20 59 28.0	3.370	3	8 6 19.55	2.3547	15 49 13.3	9.044
4	6 9 13.09	2.6078	20 56 1.4	3.517	4	8 8 40.64	2.3483	15 40 8.2	9.128
5	6 11 49.45	2.6042	20 52 26.0	3.663	5	8 11 1.35	2.3421	15 30 58.0	9.211
6	6 14 25.59	2.6004	20 48 41.9	3.808	6	8 13 21.69	2.3359	15 21 42.9	9.291
7	6 17 1.50	2.5966	20 44 49.1	3.952	7	8 15 41.66	2.3297	15 12 23.1	9.370
8	6 19 37.18	2.5926	20 40 47.7	4.094	8	8 18 1.25	2.3233	15 2 58.5	9.448
9	6 22 12.61	2.5885	20 36 37.8	4.236	9	8 20 20.46	2.3171	14 53 29.3	9.524
10	6 24 47.80	2.5843	20 32 19.4	4.377	10	8 22 39.30	2.3109	14 43 55.6	9.599
11	6 27 22.73	2.5800	20 27 52.6	4.517	11	8 24 57.77	2.3047	14 34 17.4	9.673
12	6 29 57.40	2.5756	20 23 17.4	4.656	12	8 27 15.86	2.2985	14 24 34.9	9.744
13	6 32 31.80	2.5711	20 18 33.9	4.793	13	8 29 33.59	2.2923	14 14 48.1	9.814
14	6 35 5.93	2.5665	20 13 42.2	4.929	14	8 31 50.94	2.2862	14 4 57.2	9.883
15	6 37 39.78	2.5618	20 8 42.4	5.065	15	8 34 7.93	2.2801	13 55 2.2	9.950
16	6 40 13.35	2.5572	20 3 34.4	5.200	16	8 36 24.55	2.2739	13 45 3.2	10.017
17	6 42 46.63	2.5523	19 58 18.4	5.333	17	8 38 40.80	2.2678	13 35 0.2	10.082
18	6 45 19.62	2.5473	19 52 54.5	5.464	18	8 40 56.69	2.2618	13 24 53.4	10.144
19	6 47 52.31	2.5423	19 47 22.7	5.594	19	8 43 12.21	2.2558	13 14 42.9	10.206
20	6 50 24.70	2.5373	19 41 43.2	5.724	20	8 45 27.38	2.2498	13 4 28.7	10.267
21	6 52 56.78	2.5321	19 35 55.8	5.853	21	8 47 42.18	2.2438	12 54 10.9	10.326
22	6 55 28.55	2.5268	19 30 0.9	5.979	22	8 49 56.63	2.2378	12 43 49.6	10.383
23	6 58 0.00	2.5215	19 23 58.3	6.105	23	8 52 10.71	2.2318	12 33 24.9	10.439
24	7 0 31.13	2.5162	+19 17 48.3	−6.228	24	8 54 24.45	2.2260	+12 22 56.9	−10.494

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 30.					JULY 2.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 54 24.45	2.2260	+12 22 56.9	−10.494	0	10 35 20.99	2.0008	+3 19 50.9	−11.705
1	8 56 37.83	2.2202	12 12 25.6	10.548	1	10 37 20.94	1.9976	3 8 8.6	11.705
2	8 58 50.87	2.2143	12 1 51.2	10.599	2	10 39 20.70	1.9944	2 56 26.3	11.703
3	9 1 3.55	2.2085	11 51 13.7	10.650	3	10 41 20.27	1.9912	2 44 44.2	11.702
4	9 3 15.89	2.2028	11 40 33.2	10.700	4	10 43 19.64	1.9881	2 33 2.1	11.700
5	9 5 27.89	2.1972	11 29 49.7	10.748	5	10 45 18.84	1.9852	2 21 20.2	11.696
6	9 7 39.55	2.1915	11 19 3.5	10.794	6	10 47 17.86	1.9822	2 9 38.6	11.692
7	9 9 50.87	2.1858	11 8 14.4	10.840	7	10 49 16.70	1.9793	1 57 57.2	11.687
8	9 12 1.85	2.1803	10 57 22.7	10.884	8	10 51 15.37	1.9764	1 46 16.2	11.681
9	9 14 12.50	2.1748	10 46 28.3	10.927	9	10 53 13.87	1.9736	1 34 35.5	11.674
10	9 16 22.82	2.1693	10 35 31.5	10.968	10	10 55 12.20	1.9709	1 22 55.3	11.667
11	9 18 32.81	2.1638	10 24 32.1	11.009	11	10 57 10.38	1.9683	1 11 15.5	11.658
12	9 20 42.48	2.1585	10 13 30.4	11.048	12	10 59 8.40	1.9658	0 59 36.3	11.648
13	9 22 51.83	2.1531	10 2 26.4	11.086	13	11 1 6.27	1.9633	0 47 57.7	11.639
14	9 25 0.85	2.1478	9 51 20.1	11.123	14	11 3 3.99	1.9608	0 36 19.6	11.629
15	9 27 9.56	2.1426	9 40 11.7	11.158	15	11 5 1.56	1.9583	0 24 42.2	11.617
16	9 29 17.96	2.1373	9 29 1.2	11.192	16	11 6 58.99	1.9560	0 13 5.6	11.605
17	9 31 26.04	2.1322	9 17 48.7	11.224	17	11 8 56.28	1.9538	+0 1 29.6	11.593
18	9 33 33.82	2.1272	9 6 34.3	11.256	18	11 10 53.44	1.9515	−0 10 5.5	11.578
19	9 35 41.30	2.1221	8 55 18.0	11.287	19	11 12 50.46	1.9493	0 21 39.8	11.564
20	9 37 48.47	2.1171	8 43 59.9	11.316	20	11 14 47.36	1.9473	0 33 13.2	11.549
21	9 39 55.35	2.1122	8 32 40.1	11.344	21	11 16 44.14	1.9453	0 44 45.7	11.533
22	9 42 1.93	2.1073	8 21 18.6	11.372	22	11 18 40.79	1.9433	0 56 17.2	11.517
23	9 44 8.23	2.1025	+ 8 9 55.5	−11.398	23	11 20 37.33	1.9414	−1 7 47.7	−11.499
	JULY 1.					JULY 3.			
0	9 46 14.23	2.0977	+ 7 58 30.9	−11.422	0	11 22 33.76	1.9396	−1 19 17.1	−11.481
1	9 48 19.95	2.0930	7 47 4.9	11.445	1	11 24 30.08	1.9378	1 30 45.4	11.463
2	9 50 25.39	2.0883	7 35 37.5	11.468	2	11 26 26.29	1.9361	1 42 12.6	11.444
3	9 52 30.55	2.0838	7 24 8.8	11.489	3	11 28 22.41	1.9344	1 53 38.7	11.424
4	9 54 35.44	2.0792	7 12 38.8	11.510	4	11 30 18.42	1.9328	2 5 3.5	11.403
5	9 56 40.05	2.0747	7 1 7.6	11.529	5	11 32 14.34	1.9313	2 16 27.0	11.382
6	9 58 44.40	2.0703	6 49 35.3	11.548	6	11 34 10.18	1.9298	2 27 49.3	11.360
7	10 0 48.48	2.0659	6 38 1.9	11.564	7	11 36 5.92	1.9283	2 39 10.2	11.337
8	10 2 52.31	2.0616	6 26 27.6	11.580	8	11 38 1.58	1.9270	2 50 29.7	11.314
9	10 4 55.87	2.0573	6 14 52.3	11.596	9	11 39 57.16	1.9258	3 1 47.9	11.290
10	10 6 59.18	2.0531	6 3 16.1	11.610	10	11 41 52.67	1.9245	3 13 4.5	11.265
11	10 9 2.24	2.0490	5 51 39.1	11.623	11	11 43 48.10	1.9233	3 24 19.7	11.241
12	10 11 5.06	2.0450	5 40 1.3	11.635	12	11 45 43.46	1.9222	3 35 33.4	11.215
13	10 13 7.64	2.0409	5 28 22.9	11.646	13	11 47 38.76	1.9211	3 46 45.5	11.188
14	10 15 9.97	2.0369	5 16 43.8	11.656	14	11 49 33.99	1.9201	3 57 56.0	11.161
15	10 17 12.07	2.0331	5 5 4.2	11.665	15	11 51 29.17	1.9193	4 9 4.8	11.133
16	10 19 13.94	2.0293	4 53 24.0	11.673	16	11 53 24.30	1.9183	4 20 12.0	11.105
17	10 21 15.58	2.0254	4 41 43.4	11.681	17	11 55 19.37	1.9174	4 31 17.4	11.076
18	10 23 16.99	2.0218	4 30 2.3	11.687	18	11 57 14.39	1.9167	4 42 21.1	11.047
19	10 25 18.19	2.0182	4 18 21.0	11.692	19	11 59 9.37	1.9160	4 53 23.0	11.016
20	10 27 19.17	2.0145	4 6 39.3	11.697	20	12 1 4.31	1.9153	5 4 23.0	10.985
21	10 29 19.93	2.0110	3 54 57.4	11.699	21	12 2 59.21	1.9147	5 15 21.2	10.954
22	10 31 20.49	2.0076	3 43 15.4	11.702	22	12 4 54.07	1.9141	5 26 17.5	10.923
23	10 33 20.84	2.0042	3 31 33.2	11.704	23	12 6 48.90	1.9137	5 37 11.9	10.890
24	10 35 20.99	2.0008	+ 3 19 50.9	−11.705	24	12 8 43.71	1.9133	−5 48 4.3	−10.857

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 4.					JULY 6.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 8 43.71	1.9133	− 5 48 4.3	−10.857	0	13 41 1.98	1.9505	−13 40 23.3	−8.613
1	12 10 38.49	1.9128	5 58 54.7	10.823	1	13 42 59.06	1.9523	13 48 58.3	8.554
2	12 12 33.25	1.9125	6 9 43.1	10.788	2	13 44 56.26	1.9542	13 57 29.8	8.493
3	12 14 27.99	1.9123	6 20 29.3	10.753	3	13 46 53.56	1.9560	14 5 57.5	8.432
4	12 16 22.72	1.9121	6 31 13.5	10.718	4	13 48 50.98	1.9579	14 14 21.6	8.371
5	12 18 17.44	1.9119	6 41 55.5	10.683	5	13 50 48.51	1.9598	14 22 42.0	8.309
6	12 20 12.15	1.9118	6 52 35.4	10.646	6	13 52 46.16	1.9618	14 30 58.7	8.247
7	12 22 6.85	1.9117	7 3 13.0	10.608	7	13 54 43.93	1.9638	14 39 11.6	8.183
8	12 24 1.55	1.9117	7 13 48.4	10.572	8	13 56 41.82	1.9658	14 47 20.6	8.118
9	12 25 56.25	1.9118	7 24 21.6	10.533	9	13 58 39.83	1.9679	14 55 25.8	8.055
10	12 27 50.96	1.9119	7 34 52.4	10.493	10	14 0 37.97	1.9700	15 3 27.2	7.990
11	12 29 45.68	1.9120	7 45 20.8	10.454	11	14 2 36.23	1.9721	15 11 24.6	7.924
12	12 31 40.40	1.9122	7 55 46.9	10.415	12	14 4 34.62	1.9743	15 19 18.1	7.858
13	12 33 35.14	1.9125	8 6 10.6	10.374	13	14 6 33.14	1.9764	15 27 7.6	7.793
14	12 35 29.90	1.9128	8 16 31.8	10.333	14	14 8 31.79	1.9786	15 34 53.2	7.726
15	12 37 24.68	1.9131	8 26 50.5	10.291	15	14 10 30.57	1.9808	15 42 34.7	7.658
16	12 39 19.47	1.9135	8 37 6.7	10.249	16	14 12 29.49	1.9831	15 50 12.1	7.589
17	12 41 14.30	1.9141	8 47 20.4	10.207	17	14 14 28.54	1.9853	15 57 45.4	7.521
18	12 43 9.16	1.9145	8 57 31.5	10.163	18	14 16 27.73	1.9877	16 5 14.6	7.452
19	12 45 4.04	1.9150	9 7 39.9	10.119	19	14 18 27.06	1.9900	16 12 39.6	7.382
20	12 46 58.96	1.9158	9 17 45.8	10.075	20	14 20 26.53	1.9923	16 20 0.4	7.312
21	12 48 53.93	1.9164	9 27 48.9	10.029	21	14 22 26.13	1.9946	16 27 17.0	7.242
22	12 50 48.93	1.9170	9 37 49.3	9.984	22	14 24 25.88	1.9970	16 34 29.4	7.170
23	12 52 43.97	1.9178	− 9 47 47.0	− 9.938	23	14 26 25.77	1.9994	−16 41 37.4	−7.098
	JULY 5.					JULY 7.			
0	12 54 39.06	1.9186	− 9 57 41.9	− 9.892	0	14 28 25.81	2.0018	−16 48 41.1	−7.026
1	12 56 34.20	1.9194	10 7 34.0	9.845	1	14 30 25.99	2.0043	16 55 40.5	6.953
2	12 58 29.39	1.9203	10 17 23.3	9.798	2	14 32 26.32	2.0067	17 2 35.4	6.878
3	13 0 24.64	1.9213	10 27 9.7	9.749	3	14 34 26.79	2.0091	17 9 25.9	6.805
4	13 2 19.94	1.9223	10 36 53.2	9.700	4	14 36 27.41	2.0116	17 16 12.0	6.731
5	13 4 15.31	1.9233	10 46 33.7	9.651	5	14 38 28.18	2.0141	17 22 53.6	6.655
6	13 6 10.73	1.9243	10 56 11.3	9.602	6	14 40 29.10	2.0166	17 29 30.6	6.579
7	13 8 6.22	1.9254	11 5 45.9	9.552	7	14 42 30.17	2.0191	17 36 3.1	6.503
8	13 10 1.78	1.9266	11 15 17.5	9.501	8	14 44 31.39	2.0217	17 42 31.0	6.427
9	13 11 57.41	1.9278	11 24 46.0	9.448	9	14 46 32.77	2.0242	17 48 54.3	6.350
10	13 13 53.12	1.9291	11 34 11.3	9.397	10	14 48 34.29	2.0267	17 55 13.0	6.273
11	13 15 48.90	1.9303	11 43 33.6	9.345	11	14 50 35.97	2.0293	18 1 27.0	6.193
12	13 17 44.75	1.9316	11 52 52.7	9.292	12	14 52 37.80	2.0318	18 7 36.2	6.114
13	13 19 40.69	1.9329	12 2 8.6	9.238	13	14 54 39.79	2.0344	18 13 40.7	6.035
14	13 21 36.70	1.9343	12 11 21.3	9.184	14	14 56 41.93	2.0370	18 19 40.4	5.956
15	13 23 32.81	1.9358	12 20 30.7	9.129	15	14 58 44.23	2.0396	18 25 35.4	5.875
16	13 25 29.00	1.9373	12 29 36.8	9.074	16	15 0 46.68	2.0422	18 31 25.4	5.793
17	13 27 25.29	1.9388	12 38 39.6	9.018	17	15 2 49.29	2.0448	18 37 10.6	5.713
18	13 29 21.66	1.9403	12 47 39.0	8.963	18	15 4 52.05	2.0473	18 42 50.9	5.631
19	13 31 18.13	1.9420	12 56 35.1	8.906	19	15 6 54.97	2.0500	18 48 26.3	5.548
20	13 33 14.70	1.9437	13 5 27.7	8.848	20	15 8 58.05	2.0526	18 53 56.7	5.465
21	13 35 11.37	1.9453	13 14 16.9	8.790	21	15 11 1.28	2.0552	18 59 22.1	5.382
22	13 37 8.13	1.9469	13 23 2.5	8.732	22	15 13 4.67	2.0578	19 4 42.5	5.298
23	13 39 5.00	1.9488	13 31 44.7	8.673	23	15 15 8.21	2.0603	19 9 57.8	5.213
	13 41 1.98	1.9505	−13 40 23.3	− 8.613	24	15 17 11.91	2.0630	−19 15 8.0	−5.128

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
		JULY 8.					JULY 10.		
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 17 11.91	2.0630	−19 15 8.0	−5.128	0	16 58 58.12	2.1685	−21 34 14.6	−0.513
1	15 19 15.77	2.0656	19 20 13.1	5.042	1	17 1 8.28	2.1700	21 34 42.2	0.408
2	15 21 19.78	2.0681	19 25 13.0	4.955	2	17 3 18.52	2.1714	21 35 3.5	0.303
3	15 23 23.94	2.0707	19 30 7.7	4.869	3	17 5 28.85	2.1728	21 35 18.6	0.198
4	15 25 28.26	2.0733	19 34 57.3	4.782	4	17 7 39.26	2.1742	21 35 27.2	−0.092
5	15 27 32.74	2.0759	19 39 41.5	4.693	5	17 9 49.75	2.1755	21 35 29.6	+0.013
6	15 29 37.37	2.0785	19 44 20.5	4.606	6	17 12 0.32	2.1768	21 35 25.6	0.119
7	15 31 42.16	2.0810	19 48 54.2	4.518	7	17 14 10.96	2.1780	21 35 15.3	0.225
8	15 33 47.09	2.0836	19 53 22.6	4.428	8	17 16 21.68	2.1793	21 34 58.6	0.332
9	15 35 52.19	2.0862	19 57 45.6	4.338	9	17 18 32.47	2.1803	21 34 35.5	0.438
10	15 37 57.43	2.0886	20 2 3.2	4.248	10	17 20 43.32	2.1814	21 34 6.1	0.544
11	15 40 2.82	2.0912	20 6 15.4	4.158	11	17 22 54.24	2.1825	21 33 30.2	0.651
12	15 42 8.37	2.0938	20 10 22.1	4.067	12	17 25 5.22	2.1835	21 32 48.0	0.758
13	15 44 14.07	2.0962	20 14 23.4	3.975	13	17 27 16.26	2.1845	21 31 59.3	0.864
14	15 46 19.91	2.0986	20 18 19.1	3.883	14	17 29 27.36	2.1854	21 31 4.3	0.971
15	15 48 25.90	2.1011	20 22 9.3	3.790	15	17 31 38.51	2.1863	21 30 2.8	1.079
16	15 50 32.04	2.1036	20 25 53.9	3.698	16	17 33 49.71	2.1872	21 28 54.8	1.186
17	15 52 38.33	2.1060	20 29 33.0	3.604	17	17 36 0.97	2.1879	21 27 40.5	1.293
18	15 54 44.76	2.1084	20 33 6.4	3.510	18	17 38 12.26	2.1887	21 26 19.7	1.400
19	15 56 51.34	2.1108	20 36 34.2	3.416	19	17 40 23.61	2.1894	21 24 52.5	1.508
20	15 58 58.06	2.1132	20 39 56.3	3.321	20	17 42 34.99	2.1900	21 23 18.8	1.615
21	16 1 4.92	2.1156	20 43 12.7	3.226	21	17 44 46.41	2.1906	21 21 38.7	1.722
22	16 3 11.93	2.1179	20 46 23.4	3.130	22	17 46 57.86	2.1912	21 19 52.2	1.829
23	16 5 19.07	2.1202	−20 49 28.3	−3.034	23	17 49 9.35	2.1918	−21 17 59.2	+1.937
		JULY 9.					JULY 11.		
0	16 7 26.35	2.1225	−20 52 27.5	−2.938	0	17 51 20.87	2.1923	−21 15 59.8	+2.044
1	16 9 33.77	2.1248	20 55 20.9	2.841	1	17 53 32.42	2.1927	21 13 53.9	2.152
2	16 11 41.32	2.1269	20 58 8.4	2.743	2	17 55 43.99	2.1930	21 11 41.6	2.259
3	16 13 49.00	2.1292	21 0 50.1	2.646	3	17 57 55.58	2.1934	21 9 22.8	2.367
4	16 15 56.82	2.1314	21 3 25.9	2.548	4	18 0 7.20	2.1938	21 6 57.6	2.473
5	16 18 4.77	2.1335	21 5 55.8	2.449	5	18 2 18.83	2.1939	21 4 26.0	2.580
6	16 20 12.84	2.1357	21 8 19.8	2.350	6	18 4 30.47	2.1942	21 1 48.0	2.688
7	16 22 21.05	2.1378	21 10 37.8	2.251	7	18 6 42.13	2.1943	20 59 3.5	2.795
8	16 24 29.38	2.1398	21 12 49.9	2.151	8	18 8 53.79	2.1944	20 56 12.6	2.902
9	16 26 37.83	2.1418	21 14 55.9	2.051	9	18 11 5.46	2.1946	20 53 15.3	3.009
10	16 28 46.40	2.1439	21 16 56.0	1.951	10	18 13 17.14	2.1946	20 50 11.5	3.116
11	16 30 55.10	2.1459	21 18 50.0	1.850	11	18 15 28.81	2.1946	20 47 1.4	3.222
12	16 33 3.91	2.1478	21 20 38.0	1.749	12	18 17 40.49	2.1946	20 43 44.9	3.328
13	16 35 12.84	2.1498	21 22 19.9	1.648	13	18 19 52.16	2.1944	20 40 22.0	3.435
14	16 37 21.88	2.1517	21 23 55.7	1.546	14	18 22 3.82	2.1943	20 36 52.7	3.541
15	16 39 31.04	2.1535	21 25 25.4	1.443	15	18 24 15.48	2.1942	20 33 17.1	3.647
16	16 41 40.30	2.1553	21 26 48.9	1.342	16	18 26 27.12	2.1939	20 29 35.1	3.753
17	16 43 49.68	2.1572	21 28 6.4	1.239	17	18 28 38.75	2.1937	20 25 46.8	3.858
18	16 45 59.16	2.1588	21 29 17.6	1.136	18	18 30 50.36	2.1934	20 21 52.2	3.963
19	16 48 8.74	2.1605	21 30 22.7	1.033	19	18 33 1.96	2.1931	20 17 51.2	4.068
20	16 50 18.42	2.1622	21 31 21.5	0.928	20	18 35 13.53	2.1927	20 13 44.0	4.173
21	16 52 28.20	2.1638	21 32 14.1	0.825	21	18 37 25.08	2.1923	20 9 30.4	4.278
22	16 54 38.08	2.1655	21 33 0.5	0.722	22	18 39 36.60	2.1918	20 5 10.6	4.383
23	16 56 48.06	2.1670	21 33 40.7	0.618	23	18 41 48.10	2.1913	20 0 44.5	4.48
24	16 58 58.12	2.1685	−21 34 14.6	−0.513	24	18 43 59.56	2.1908	−19 56 12.2	+4.

MOON, 1919.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 12.					JULY 14.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 43 59.56	2.1908	−19 56 12.2	+4.590	0	20 28 0.99	2.1367	−14 24 10.4	+ 9.038
1	18 46 10.99	2.1903	19 51 33.7	4.693	1	20 30 9.15	2.1353	14 15 5.8	9.115
2	18 48 22.39	2.1897	19 46 49.0	4.797	2	20 32 17.23	2.1340	14 5 56.6	9.192
3	18 50 33.75	2.1890	19 41 58.1	4.900	3	20 34 25.23	2.1327	13 56 42.8	9.268
4	18 52 45.07	2.1883	19 37 1.0	5.003	4	20 36 33.15	2.1313	13 47 24.4	9.344
5	18 54 56.35	2.1876	19 31 57.8	5.105	5	20 38 40.99	2.1300	13 38 1.5	9.418
6	18 57 7.58	2.1868	19 26 48.4	5.207	6	20 40 48.75	2.1287	13 28 34.2	9.492
7	18 59 18.77	2.1862	19 21 33.0	5.308	7	20 42 56.43	2.1273	13 19 2.5	9.565
8	19 1 29.92	2.1853	19 16 11.5	5.409	8	20 45 4.03	2.1260	13 9 26.4	9.638
9	19 3 41.01	2.1845	19 10 43.9	5.510	9	20 47 11.55	2.1248	12 59 45.9	9.710
10	19 5 52.06	2.1837	19 5 10.3	5.611	10	20 49 19.00	2.1235	12 50 1.2	9.780
11	19 8 3.05	2.1828	18 59 30.6	5.711	11	20 51 26.37	2.1222	12 40 12.3	9.850
12	19 10 13.99	2.1818	18 53 45.0	5.810	12	20 53 33.66	2.1209	12 30 19.2	9.919
13	19 12 24.87	2.1809	18 47 53.4	5.909	13	20 55 40.88	2.1197	12 20 22.0	9.988
14	19 14 35.70	2.1800	18 41 55.9	6.008	14	20 57 48.02	2.1184	12 10 20.7	10.055
15	19 16 46.47	2.1789	18 35 52.5	6.107	15	20 59 55.09	2.1172	12 0 15.4	10.122
16	19 18 57.17	2.1778	18 29 43.1	6.204	16	21 2 2.08	2.1160	11 50 6.1	10.188
17	19 21 7.81	2.1768	18 23 28.0	6.302	17	21 4 9.01	2.1149	11 39 52.8	10.253
18	19 23 18.39	2.1758	18 17 6.9	6.399	18	21 6 15.87	2.1137	11 29 35.7	10.317
19	19 25 28.91	2.1747	18 10 40.1	6.495	19	21 8 22.65	2.1125	11 19 14.8	10.380
20	19 27 39.35	2.1735	18 4 7.5	6.591	20	21 10 29.37	2.1115	11 8 50.1	10.443
21	19 29 49.73	2.1724	17 57 29.2	6.686	21	21 12 36.03	2.1104	10 58 21.6	10.505
22	19 32 0.04	2.1713	17 50 45.2	6.781	22	21 14 42.62	2.1093	10 47 49.5	10.566
23	19 34 10.28	2.1701	−17 43 55.5	+6.876	23	21 16 49.15	2.1083	−10 37 13.7	+10.626
	JULY 13.					JULY 15.			
0	19 36 20.45	2.1689	−17 37 0.1	+6.970	0	21 18 55.62	2.1073	−10 26 34.4	+10.684
1	19 38 30.55	2.1677	17 29 59.1	7.063	1	21 21 2.03	2.1063	10 15 51.6	10.743
2	19 40 40.57	2.1663	17 22 52.6	7.155	2	21 23 8.38	2.1053	10 5 5.3	10.801
3	19 42 50.51	2.1651	17 15 40.5	7.248	3	21 25 14.67	2.1044	9 54 15.5	10.858
4	19 45 0.38	2.1639	17 8 22.9	7.339	4	21 27 20.91	2.1035	9 43 22.4	10.912
5	19 47 10.18	2.1627	17 0 59.8	7.430	5	21 29 27.09	2.1026	9 32 26.1	10.967
6	19 49 19.90	2.1613	16 53 31.3	7.520	6	21 31 33.22	2.1018	9 21 26.4	11.022
7	19 51 29.54	2.1600	16 45 57.4	7.610	7	21 33 39.31	2.1010	9 10 23.5	11.073
8	19 53 39.10	2.1587	16 38 18.1	7.700	8	21 35 45.34	2.1002	8 59 17.6	11.125
9	19 55 48.58	2.1574	16 30 33.4	7.788	9	21 37 51.33	2.0995	8 48 8.5	11.178
10	19 57 57.99	2.1561	16 22 43.5	7.876	10	21 39 57.28	2.0988	8 36 56.3	11.228
11	20 0 7.31	2.1547	16 14 48.3	7.963	11	21 42 3.18	2.0980	8 25 41.2	11.276
12	20 2 16.55	2.1533	16 6 47.9	8.050	12	21 44 9.04	2.0973	8 14 23.2	11.324
13	20 4 25.71	2.1519	15 58 42.3	8.136	13	21 46 14.86	2.0968	8 3 2.3	11.372
14	20 6 34.78	2.1506	15 50 31.6	8.222	14	21 48 20.65	2.0963	7 51 38.6	11.418
15	20 8 43.78	2.1493	15 42 15.7	8.307	15	21 50 26.41	2.0957	7 40 12.1	11.464
16	20 10 52.69	2.1478	15 33 54.8	8.390	16	21 52 32.13	2.0951	7 28 42.9	11.509
17	20 13 1.52	2.1465	15 25 28.9	8.473	17	21 54 37.82	2.0947	7 17 11.0	11.553
18	20 15 10.27	2.1451	15 16 58.0	8.556	18	21 56 43.49	2.0943	7 5 36.6	11.595
19	20 17 18.93	2.1437	15 8 22.2	8.638	19	21 58 49.13	2.0938	6 53 59.6	11.638
20	20 19 27.51	2.1423	14 59 41.4	8.720	20	22 0 54.75	2.0934	6 42 20.1	11.678
21	20 21 36.01	2.1409	14 50 55.8	8.800	21	22 3 0.34	2.0931	6 30 38.2	11.718
22	20 23 44.42	2.1395	14 42 5.4	8.879	22	22 5 5.92	2.0929	6 18 54.0	11.757
23	20 25 52.75	2.1381	14 33 10.3	8.958	23	22 7 11.49	2.0927	6 7 7.4	11.795
24	20 28 0.99	2.1367	−14 24 10.4	+9.038	24	22 9 17.04	2.0924	− 5 55 18.6	+11.832

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 16.					JULY 18.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 9 17.04	2.0924	−5 55 18.6	+11.832	0	23 50 23.95	2.1405	+ 3 56 16.5	+12.415
1	22 11 22.58	2.0923	5 43 27.6	11.868	1	23 52 32.45	2.1428	4 8 41.0	12.401
2	22 13 28.12	2.0922	5 31 34.4	11.903	2	23 54 41.09	2.1452	4 21 4.6	12.386
3	22 15 33.64	2.0921	5 19 39.2	11.938	3	23 56 49.87	2.1475	4 33 27.3	12.369
4	22 17 39.17	2.0921	5 7 41.9	11.971	4	23 58 58.79	2.1500	4 45 48.9	12.351
5	22 19 44.69	2.0921	4 55 42.7	12.003	5	0 1 7.87	2.1526	4 58 9.4	12.333
6	22 21 50.22	2.0922	4 43 41.6	12.034	6	0 3 17.10	2.1552	5 10 28.8	12.313
7	22 23 55.75	2.0923	4 31 38.6	12.065	7	0 5 26.49	2.1578	5 22 46.9	12.291
8	22 26 1.30	2.0925	4 19 33.8	12.094	8	0 7 36.03	2.1604	5 35 3.7	12.269
9	22 28 6.85	2.0926	4 7 27.3	12.122	9	0 9 45.74	2.1632	5 47 19.2	12.246
10	22 30 12.41	2.0929	3 55 19.2	12.149	10	0 11 55.61	2.1660	5 59 33.2	12.220
11	22 32 18.00	2.0933	3 43 9.4	12.176	11	0 14 5.66	2.1688	6 11 45.6	12.194
12	22 34 23.60	2.0936	3 30 58.1	12.201	12	0 16 15.87	2.1717	6 23 56.5	12.168
13	22 36 29.23	2.0940	3 18 45.3	12.225	13	0 18 26.26	2.1747	6 36 5.7	12.139
14	22 38 34.88	2.0943	3 6 31.1	12.248	14	0 20 36.83	2.1777	6 48 13.2	12.110
15	22 40 40.55	2.0948	2 54 15.5	12.271	15	0 22 47.58	2.1808	7 0 18.9	12.080
16	22 42 46.26	2.0955	2 41 58.6	12.292	16	0 24 58.52	2.1838	7 12 22.8	12.048
17	22 44 52.01	2.0961	2 29 40.5	12.313	17	0 27 9.64	2.1869	7 24 24.7	12.014
18	22 46 57.79	2.0967	2 17 21.1	12.332	18	0 29 20.95	2.1902	7 36 24.5	11.980
19	22 49 3.61	2.0973	2 5 0.7	12.349	19	0 31 32.46	2.1934	7 48 22.3	11.945
20	22 51 9.47	2.0981	1 52 39.2	12.367	20	0 33 44.16	2.1968	8 0 17.9	11.909
21	22 53 15.38	2.0989	1 40 16.7	12.383	21	0 35 56.07	2.2001	8 12 11.4	11.872
22	22 55 21.34	2.0998	1 27 53.3	12.398	22	0 38 8.17	2.2034	8 24 2.5	11.832
23	22 57 27.35	2.1007	−1 15 28.9	+12.413	23	0 40 20.48	2.2069	+ 8 35 51.2	+11.792
	JULY 17.					JULY 19.			
0	22 59 33.42	2.1017	−1 3 3.8	+12.425	0	0 42 33.00	2.2104	+ 8 47 37.5	+11.750
1	23 1 39.55	2.1026	0 50 37.9	12.437	1	0 44 45.73	2.2139	8 59 21.2	11.708
2	23 3 45.73	2.1037	0 38 11.4	12.448	2	0 46 58.67	2.2175	9 11 2.4	11.663
3	23 5 51.99	2.1048	0 25 44.2	12.458	3	0 49 11.83	2.2212	9 22 40.8	11.618
4	23 7 58.31	2.1059	0 13 16.4	12.467	4	0 51 25.21	2.2248	9 34 16.5	11.572
5	23 10 4.70	2.1071	−0 0 48.2	12.474	5	0 53 38.81	2.2285	9 45 49.4	11.524
6	23 12 11.16	2.1084	+0 11 40.5	12.481	6	0 55 52.63	2.2323	9 57 19.4	11.475
7	23 14 17.71	2.1098	0 24 9.5	12.487	7	0 58 6.69	2.2362	10 8 46.4	11.424
8	23 16 24.33	2.1111	0 36 38.9	12.492	8	1 0 20.97	2.2399	10 20 10.3	11.373
9	23 18 31.04	2.1126	0 49 8.5	12.494	9	1 2 35.48	2.2438	10 31 31.1	11.321
10	23 20 37.84	2.1140	1 1 38.2	12.497	10	1 4 50.23	2.2478	10 42 48.8	11.267
11	23 22 44.72	2.1155	1 14 8.1	12.498	11	1 7 5.22	2.2518	10 54 3.1	11.211
12	23 24 51.70	2.1171	1 26 38.0	12.498	12	1 9 20.44	2.2558	11 5 14.1	11.155
13	23 26 58.77	2.1188	1 39 7.9	12.498	13	1 11 35.91	2.2598	11 16 21.7	11.097
14	23 29 5.95	2.1205	1 51 37.7	12.496	14	1 13 51.62	2.2638	11 27 25.7	11.038
15	23 31 13.23	2.1222	2 4 7.4	12.493	15	1 16 7.57	2.2679	11 38 26.2	10.977
16	23 33 20.61	2.1240	2 16 36.8	12.488	16	1 18 23.77	2.2722	11 49 22.9	10.915
17	23 35 28.11	2.1259	2 29 5.9	12.483	17	1 20 40.23	2.2763	12 0 16.0	10.853
18	23 37 35.72	2.1278	2 41 34.7	12.477	18	1 22 56.93	2.2806	12 11 5.3	10.788
19	23 39 43.45	2.1298	2 54 3.1	12.469	19	1 25 13.89	2.2848	12 21 50.6	10.723
20	23 41 51.29	2.1318	3 6 31.0	12.461	20	1 27 31.11	2.2891	12 32 32.0	10.656
21	23 43 59.26	2.1339	3 18 58.4	12.451	21	1 29 48.58	2.2933	12 43 9.3	10.588
22	23 46 7.36	2.1361	3 31 25.1	12.440	22	1 32 6.31	2.2978	12 53 42.5	10.519
23	23 48 15.59	2.1383	3 43 51.2	12.428	23	1 34 24.31	2.3021	13 4 11.6	10.448
24	23 50 23.95	2.1405	+3 56 16.5	+12.415	24	1 36 42.56	2.3064	+13 14 36.3	+10.376

MOON, 1919.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 20.					JULY 22.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 36 42.56	2.3064	+13 14 36.3	+10.376	0	3 32 34.09	2.5146	+19 45 33.9	+5.448
1	1 39 1.08	2.3108	13 24 56.7	10.303	1	3 35 5.07	2.5181	19 50 56.9	5.318
2	1 41 19.86	2.3153	13 35 12.7	10.228	2	3 37 36.26	2.5215	19 56 12.0	5.187
3	1 43 38.91	2.3198	13 45 24.1	10.152	3	3 40 7.65	2.5248	20 1 19.3	5.054
4	1 45 58.23	2.3243	13 55 30.9	10.075	4	3 42 39.24	2.5282	20 6 18.5	4.921
5	1 48 17.82	2.3287	14 5 33.1	9.997	5	3 45 11.03	2.5314	20 11 9.8	4.788
6	1 50 37.67	2.3332	14 15 30.5	9.918	6	3 47 43.01	2.5346	20 15 53.0	4.652
7	1 52 57.80	2.3378	14 25 23.2	9.837	7	3 50 15.18	2.5377	20 20 28.0	4.516
8	1 55 18.20	2.3422	14 35 10.9	9.753	8	3 52 47.53	2.5407	20 24 54.9	4.380
9	1 57 38.86	2.3468	14 44 53.6	9.670	9	3 55 20.06	2.5436	20 29 13.6	4.243
10	1 59 59.81	2.3513	14 54 31.3	9.586	10	3 57 52.76	2.5464	20 33 24.0	4.104
11	2 2 21.02	2.3558	15 4 3.9	9.499	11	4 0 25.63	2.5492	20 37 26.1	3.965
12	2 4 42.51	2.3605	15 13 31.2	9.412	12	4 2 58.66	2.5518	20 41 19.8	3.826
13	2 7 4.28	2.3650	15 22 53.3	9.323	13	4 5 31.85	2.5544	20 45 5.2	3.686
14	2 9 26.31	2.3696	15 32 9.9	9.233	14	4 8 5.19	2.5569	20 48 42.1	3.544
15	2 11 48.63	2.3743	15 41 21.2	9.142	15	4 10 38.68	2.5593	20 52 10.5	3.403
16	2 14 11.22	2.3788	15 50 26.9	9.048	16	4 13 12.31	2.5616	20 55 30.5	3.262
17	2 16 34.08	2.3833	15 59 27.0	8.955	17	4 15 46.07	2.5638	20 58 41.9	3.118
18	2 18 57.22	2.3880	16 8 21.5	8.860	18	4 18 19.96	2.5659	21 1 44.6	2.974
19	2 21 20.64	2.3926	16 17 10.2	8.763	19	4 20 53.98	2.5680	21 4 38.8	2.831
20	2 23 44.33	2.3971	16 25 53.1	8.665	20	4 23 28.12	2.5698	21 7 24.3	2.686
21	2 26 8.29	2.4017	16 34 30.0	8.566	21	4 26 2.36	2.5717	21 10 1.1	2.541
22	2 28 32.53	2.4063	16 43 1.0	8.467	22	4 28 36.72	2.5734	21 12 29.2	2.396
23	2 30 57.04	2.4108	+16 51 26.0	+ 8.365	23	4 31 11.17	2.5750	+21 14 48.6	+2.250
	JULY 21.					JULY 23.			
0	2 33 21.82	2.4153	+16 59 44.8	+ 8.262	0	4 33 45.72	2.5766	+21 16 59.2	+2.103
1	2 35 46.87	2.4198	17 7 57.4	8.158	1	4 36 20.36	2.5779	21 19 1.0	1.957
2	2 38 12.20	2.4243	17 16 3.8	8.053	2	4 38 55.07	2.5792	21 20 54.0	1.809
3	2 40 37.79	2.4288	17 24 3.8	7.946	3	4 41 29.86	2.5804	21 22 38.1	1.662
4	2 43 3.65	2.4332	17 31 57.4	7.839	4	4 44 4.72	2.5816	21 24 13.4	1.515
5	2 45 29.77	2.4377	17 39 44.5	7.730	5	4 46 39.65	2.5825	21 25 39.9	1.367
6	2 47 56.17	2.4421	17 47 25.0	7.620	6	4 49 14.62	2.5833	21 26 57.4	1.218
7	2 50 22.82	2.4464	17 54 58.9	7.509	7	4 51 49.65	2.5841	21 28 6.0	1.070
8	2 52 49.74	2.4508	18 2 26.1	7.398	8	4 54 24.71	2.5847	21 29 5.8	0.922
9	2 55 16.91	2.4551	18 9 46.6	7.283	9	4 56 59.81	2.5853	21 29 56.6	0.773
10	2 57 44.35	2.4594	18 17 0.1	7.168	10	4 59 34.94	2.5858	21 30 38.5	0.623
11	3 0 12.04	2.4636	18 24 6.8	7.053	11	5 2 10.10	2.5860	21 31 11.4	0.474
12	3 2 39.98	2.4678	18 31 6.5	6.936	12	5 4 45.26	2.5862	21 31 35.4	0.325
13	3 5 8.18	2.4720	18 37 59.1	6.818	13	5 7 20.44	2.5863	21 31 50.4	0.176
14	3 7 36.62	2.4761	18 44 44.6	6.698	14	5 9 55.61	2.5862	21 31 56.5	+0.028
15	3 10 5.31	2.4802	18 51 22.9	6.578	15	5 12 30.78	2.5861	21 31 53.7	−0.122
16	3 12 34.24	2,4842	18 57 54.0	6.457	16	5 15 5.94	2.5858	21 31 41.9	0.272
17	3 15 3.41	2.4883	19 4 17.7	6.334	17	5 17 41.07	2.5853	21 31 21.1	0.421
18	3 17 32.83	2.4922	19 10 34.1	6.211	18	5 20 16.18	2.5849	21 30 51.4	0.569
19	3 20 2.47	2.4960	19 16 43.0	6.086	19	5 22 51.26	2.5843	21 30 12.8	0.718
20	3 22 32.35	2.4998	19 22 44.4	5.961	20	5 25 26.30	2.5837	21 29 25.2	0.867
21	3 25 2.45	2.5036	19 28 38.3	5.834	21	5 28 1.30	2.5828	21 28 28.8	1.015
22	3 27 32.78	2.5073	19 34 24.5	5.707	22	5 30 36.24	2.5818	21 27 23.4	1.163
23	3 30 3.32	2.5109	19 40 3.1	5.578	23	5 33 11.12	2.5808	21 26 9.2	1.312
24	3 32 34.09	2.5146	+19 45 33.9	+ 5.448	24	5 35 45.93	2.5796	+21 24 46.0	−1.460

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 24.					JULY 26.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 35 45.93	2.5796	+21 24 46.0	−1.460	0	7 36 20.64	2.4135	+17 36 32.9	− 7.698
1	5 38 20.67	2.5783	21 23 14.0	1.607	1	7 38 45.30	2.4085	17 28 47.9	7.802
2	5 40 55.33	2.5769	21 21 33.2	1.753	2	7 41 9.66	2.4033	17 20 56.7	7.904
3	5 43 29.90	2.5753	21 19 43.6	1.900	3	7 43 33.70	2.3982	17 12 59.4	8.005
4	5 46 4.37	2.5738	21 17 45.2	2.047	4	7 45 57.44	2.3931	17 4 56.1	8.105
5	5 48 38.75	2.5721	21 15 38.0	2.193	5	7 48 20.87	2.3879	16 56 46.8	8.204
6	5 51 13.02	2.5703	21 13 22.1	2.338	6	7 50 43.99	2.3828	16 48 31.6	8.301
7	5 53 47.18	2.5683	21 10 57.5	2.482	7	7 53 6.80	2.3775	16 40 10.7	8.396
8	5 56 21.21	2.5662	21 8 24.3	2.626	8	7 55 29.29	2.3723	16 31 44.1	8.491
9	5 58 55.12	2.5641	21 5 42.4	2.771	9	7 57 51.47	2.3670	16 23 11.8	8.584
10	6 1 28.90	2.5618	21 2 51.8	2.914	10	8 0 13.33	2.3617	16 14 34.0	8.676
11	6 4 2.54	2.5595	20 59 52.7	3.056	11	8 2 34.87	2.3563	16 5 50.7	8.766
12	6 6 36.04	2.5570	20 56 45.1	3.198	12	8 4 56.09	2.3511	15 57 2.1	8.854
13	6 9 9.38	2.5544	20 53 29.0	3.339	13	8 7 17.00	2.3458	15 48 8.2	8.942
14	6 11 42.57	2.5518	20 50 4.4	3.481	14	8 9 37.58	2.3404	15 39 9.1	9.028
15	6 14 15.59	2.5489	20 46 31.3	3.621	15	8 11 57.85	2.3352	15 30 4.8	9.113
16	6 16 48.44	2.5461	20 42 49.9	3.759	16	8 14 17.80	2.3298	15 20 55.5	9.196
17	6 19 21.12	2.5432	20 39 0.2	3.898	17	8 16 37.42	2.3244	15 11 41.3	9.278
18	6 21 53.62	2.5401	20 35 2.2	4.036	18	8 18 56.73	2.3191	15 2 22.1	9.359
19	6 24 25.93	2.5369	20 30 55.9	4.173	19	8 21 15.71	2.3137	14 52 58.2	9.438
20	6 26 58.05	2.5338	20 26 41.5	4.308	20	8 23 34.37	2.3084	14 43 29.6	9.516
21	6 29 29.98	2.5304	20 22 19.0	4.443	21	8 25 52.72	2.3031	14 33 56.3	9.593
22	6 32 1.70	2.5269	20 17 48.3	4.578	22	8 28 10.74	2.2976	14 24 18.5	9.668
23	6 34 33.21	2.5234	+20 13 9.6	−4.711	23	8 30 28.43	2.2923	+14 14 36.2	− 9.742
	JULY 25.					JULY 27.			
0	6 37 4.51	2.5198	+20 8 23.0	−4.843	0	8 32 45.81	2.2870	+14 4 49.5	− 9.813
1	6 39 35.59	2.5162	20 3 28.4	4.975	1	8 35 2.87	2.2817	13 54 58.6	9.884
2	6 42 6.45	2.5125	19 58 26.0	5.105	2	8 37 19.61	2.2764	13 45 3.4	9.954
3	6 44 37.09	2.5087	19 53 15.8	5.235	3	8 39 36.04	2.2712	13 35 4.1	10.022
4	6 47 7.49	2.5047	19 47 57.8	5.363	4	8 41 52.15	2.2658	13 25 0.8	10.088
5	6 49 37.65	2.5008	19 42 32.2	5.491	5	8 44 7.94	2.2605	13 14 53.5	10.154
6	6 52 7.58	2.4968	19 36 58.9	5.618	6	8 46 23.41	2.2553	13 4 42.3	10.218
7	6 54 37.26	2.4926	19 31 18.0	5.743	7	8 48 38.57	2.2501	12 54 27.3	10.281
8	6 57 6.69	2.4883	19 25 29.7	5.868	8	8 50 53.42	2.2449	12 44 8.6	10.342
9	6 59 35.86	2.4841	19 19 33.9	5.992	9	8 53 7.96	2.2397	12 33 46.3	10.402
10	7 2 4.78	2.4798	19 13 30.7	6.113	10	8 55 22.18	2.2344	12 23 20.4	10.461
11	7 4 33.44	2.4754	19 7 20.3	6.234	11	8 57 36.09	2.2293	12 12 51.0	10.518
12	7 7 1.83	2.4709	19 1 2.6	6.354	12	8 59 49.70	2.2243	12 2 18.2	10.574
13	7 9 29.95	2.4665	18 54 37.8	6.473	13	9 2 3.00	2.2191	11 51 42.1	10.628
14	7 11 57.81	2.4619	18 48 5.9	6.591	14	9 4 15.99	2.2140	11 41 2.8	10.681
15	7 14 25.38	2.4572	18 41 26.9	6.707	15	9 6 28.68	2.2090	11 30 20.4	10.733
16	7 16 52.67	2.4526	18 34 41.1	6.822	16	9 8 41.07	2.2039	11 19 34.9	10.783
17	7 19 19.69	2.4479	18 27 48.3	6.936	17	9 10 53.15	2.1989	11 8 46.4	10.833
18	7 21 46.42	2.4431	18 20 48.8	7.048	18	9 13 4.94	2.1940	10 57 54.9	10.881
19	7 24 12.86	2.4383	18 13 42.5	7.160	19	9 15 16.43	2.1891	10 47 0.7	10.928
20	7 26 39.01	2.4333	18 6 29.6	7.270	20	9 17 27.63	2.1843	10 36 3.6	10.973
21	7 29 4.86	2.4284	17 59 10.1	7.379	21	9 19 38.54	2.1793	10 25 3.9	11.017
22	7 31 30.42	2.4235	17 51 44.1	7.487	22	9 21 49.15	2.1744	10 14 1.6	11.059
23	7 33 55.68	2.4185	17 44 11.7	7.593	23	9 23 59.47	2.1697	10 2 56.8	11.101
24	7 36 20.64	2.4135	+17 36 32.9	−7.698	24	9 26 9.51	2.1650	+ 9 51 49.5	−11.142

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 28.					JULY 30.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 26 9.51	2.1650	+9 51 49.5	−11.142	0	11 5 27.00	1.9913	+0 32 49.6	−11.745
1	9 28 19.27	2.1603	9 40 39.8	11.180	1	11 7 26.41	1.9891	0 21 5.2	11.733
2	9 30 28.74	2.1555	9 29 27.9	11.218	2	11 9 25.69	1.9868	+0 9 21.6	11.721
3	9 32 37.93	2.1509	9 18 13.7	11.254	3	11 11 24.83	1.9846	−0 2 21.3	11.708
4	9 34 46.85	2.1463	9 6 57.4	11.290	4	11 13 23.84	1.9823	0 14 3.4	11.694
5	9 36 55.49	2.1418	8 55 38.9	11.324	5	11 15 22.71	1.9803	0 25 44.6	11.679
6	9 39 3.86	2.1373	8 44 18.5	11.356	6	11 17 21.47	1.9783	0 37 24.9	11.664
7	9 41 11.96	2.1328	8 32 56.2	11.388	7	11 19 20.10	1.9762	0 49 4.3	11.648
8	9 43 19.80	2.1284	8 21 32.0	11.418	8	11 21 18.61	1.9743	1 0 42.6	11.630
9	9 45 27.37	2.1239	8 10 6.0	11.448	9	11 23 17.01	1.9723	1 12 19.9	11.613
10	9 47 34.67	2.1196	7 58 38.3	11.475	10	11 25 15.29	1.9704	1 23 56.1	11.594
11	9 49 41.72	2.1153	7 47 9.0	11.502	11	11 27 13.46	1.9687	1 35 31.2	11.574
12	9 51 48.51	2.1111	7 35 38.1	11.528	12	11 29 11.53	1.9669	1 47 5.0	11.553
13	9 53 55.05	2.1069	7 24 5.7	11.552	13	11 31 9.49	1.9653	1 58 37.6	11.533
14	9 56 1.34	2.1027	7 12 31.9	11.575	14	11 33 7.36	1.9637	2 10 8.9	11.511
15	9 58 7.37	2.0986	7 0 56.7	11.598	15	11 35 5.13	1.9620	2 21 38.9	11.488
16	10 0 13.17	2.0946	6 49 20.2	11.618	16	11 37 2.80	1.9605	2 33 7.5	11.465
17	10 2 18.72	2.0905	6 37 42.5	11.638	17	11 39 0.39	1.9590	2 44 34.7	11.442
18	10 4 24.03	2.0865	6 26 3.6	11.658	18	11 40 57.88	1.9576	2 56 0.5	11.417
19	10 6 29.10	2.0826	6 14 23.6	11.675	19	11 42 55.30	1.9563	3 7 24.7	11.391
20	10 8 33.94	2.0788	6 2 42.6	11.692	20	11 44 52.63	1.9549	3 18 47.4	11.365
21	10 10 38.55	2.0749	5 51 0.6	11.707	21	11 46 49.89	1.9537	3 30 8.5	11.338
22	10 12 42.93	2.0712	5 39 17.8	11.721	22	11 48 47.07	1.9525	3 41 28.0	11.310
23	10 14 47.09	2.0674	+5 27 34.1	−11.735	23	11 50 44.19	1.9513	−3 52 45.7	−11.282
	JULY 29.					JULY 31.			
0	10 16 51.02	2.0638	+5 15 49.6	−11.748	0	11 52 41.23	1.9502	−4 4 1.8	−11.253
1	10 18 54.74	2.0602	5 4 4.4	11.758	1	11 54 38.21	1.9492	4 15 16.1	11.223
2	10 20 58.24	2.0565	4 52 18.6	11.768	2	11 56 35.13	1.9482	4 26 28.6	11.193
3	10 23 1.52	2.0530	4 40 32.3	11.777	3	11 58 31.99	1.9473	4 37 39.3	11.163
4	10 25 4.60	2.0496	4 28 45.4	11.786	4	12 0 28.80	1.9463	4 48 48.1	11.130
5	10 27 7.47	2.0462	4 16 58.0	11.793	5	12 2 25.55	1.9455	4 59 54.9	11.098
6	10 29 10.14	2.0428	4 5 10.3	11.798	6	12 4 22.26	1.9448	5 10 59.9	11.066
7	10 31 12.60	2.0394	3 53 22.2	11.804	7	12 6 18.92	1.9439	5 22 2.8	11.031
8	10 33 14.87	2.0363	3 41 33.8	11.808	8	12 8 15.53	1.9433	5 33 3.6	10.997
9	10 35 16.95	2.0330	3 29 45.2	11.811	9	12 10 12.11	1.9427	5 44 2.4	10.963
10	10 37 18.83	2.0298	3 17 56.5	11.813	10	12 12 8.65	1.9421	5 54 59.1	10.928
11	10 39 20.53	2.0268	3 6 7.7	11.814	11	12 14 5.16	1.9415	6 5 53.7	10.891
12	10 41 22.04	2.0237	2 54 18.8	11.814	12	12 16 1.63	1.9410	6 16 46.0	10.853
13	10 43 23.37	2.0208	2 42 30.0	11.813	13	12 17 58.08	1.9406	6 27 36.1	10.816
14	10 45 24.53	2.0178	2 30 41.2	11.812	14	12 19 54.50	1.9402	6 38 23.9	10.778
15	10 47 25.51	2.0148	2 18 52.5	11.809	15	12 21 50.90	1.9398	6 49 9.4	10.739
16	10 49 26.31	2.0120	2 7 4.1	11.805	16	12 23 47.28	1.9395	6 59 52.6	10.700
17	10 51 26.95	2.0093	1 55 15.9	11.801	17	12 25 43.64	1.9393	7 10 33.4	10.660
18	10 53 27.43	2.0066	1 43 28.0	11.796	18	12 27 40.00	1.9392	7 21 11.8	10.619
19	10 55 27.74	2.0039	1 31 40.4	11.790	19	12 29 36.34	1.9389	7 31 47.7	10.578
20	10 57 27.90	2.0013	1 19 53.2	11.783	20	12 31 32.67	1.9388	7 42 21.1	10.536
21	10 59 27.90	1.9988	1 8 6.5	11.774	21	12 33 29.00	1.9388	7 52 52.0	10.494
22	11 1 27.75	1.9963	0 56 20.3	11.766	22	12 35 25.33	1.9388	8 3 20.4	10.452
23	11 3 27.45	1.9938	0 44 34.6	11.756	23	12 37 21.66	1.9388	8 13 46.2	10.408
24	11 5 27.00	1.9913	+0 32 49.6	−11.745	24	12 39 17.99	1.9389	−8 24 9.3	−10.363

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 1.				
	h m s	s	° ′ ″	″
0	12 39 17.99	1.9389	− 8 24 9.3	−10.363
1	12 41 14.33	1.9391	8 34 29.8	10.318
2	12 43 10.68	1.9393	8 44 47.5	10.273
3	12 45 7.04	1.9394	8 55 2.6	10.228
4	12 47 3.41	1.9398	9 5 14.8	10.181
5	12 48 59.81	1.9401	9 15 24.3	10.135
6	12 50 56.22	1.9404	9 25 31.0	10.087
7	12 52 52.66	1.9408	9 35 34.7	10.038
8	12 54 49.12	1.9413	9 45 35.6	9.990
9	12 56 45.61	1.9418	9 55 33.5	9.941
10	12 58 42.13	1.9423	10 5 28.5	9.892
11	13 0 38.69	1.9429	10 15 20.5	9.841
12	13 2 35.28	1.9435	10 25 9.4	9.790
13	13 4 31.91	1.9442	10 34 55.3	9.738
14	13 6 28.58	1.9448	10 44 38.0	9.687
15	13 8 25.29	1.9456	10 54 17.7	9.634
16	13 10 22.05	1.9464	11 3 54.1	9.581
17	13 12 18.86	1.9473	11 13 27.4	9.528
18	13 14 15.72	1.9481	11 22 57.4	9.473
19	13 16 12.63	1.9490	11 32 24.2	9.419
20	13 18 9.60	1.9499	11 41 47.7	9.363
21	13 20 6.62	1.9509	11 51 7.8	9.308
22	13 22 3.71	1.9520	12 0 24.6	9.252
23	13 24 0.86	1.9530	−12 9 38.0	− 9.195
AUGUST 2.				
0	13 25 58.07	1.9541	−12 18 48.0	− 9.138
1	13 27 55.35	1.9553	12 27 54.5	9.079
2	13 29 52.70	1.9564	12 36 57.5	9.021
3	13 31 50.12	1.9576	12 45 57.0	8.963
4	13 33 47.61	1.9588	12 54 53.0	8.903
5	13 35 45.18	1.9602	13 3 45.4	8.843
6	13 37 42.83	1.9614	13 12 34.1	8.782
7	13 39 40.55	1.9628	13 21 19.2	8.722
8	13 41 38.36	1.9642	13 30 0.7	8.660
9	13 43 36.25	1.9655	13 38 38.4	8.598
10	13 45 34.22	1.9670	13 47 12.4	8.536
11	13 47 32.29	1.9685	13 55 42.7	8.473
12	13 49 30.44	1.9700	14 4 9.2	8.409
13	13 51 28.69	1.9715	14 12 31.8	8.345
14	13 53 27.02	1.9731	14 20 50.6	8.281
15	13 55 25.46	1.9748	14 29 5.5	8.216
16	13 57 23.99	1.9763	14 37 16.5	8.150
17	13 59 22.62	1.9780	14 45 23.5	8.083
18	14 1 21.35	1.9797	14 53 26.5	8.018
19	14 3 20.18	1.9814	15 1 25.6	7.951
20	14 5 19.12	1.9832	15 9 20.6	7.883
21	14 7 18.16	1.9849	15 17 11.5	7.814
22	14 9 17.31	1.9867	15 24 58.3	7.747
23	14 11 16.56	1.9885	15 32 41.1	7.678
24	14 13 15.93	1.9904	−15 40 19.6	− 7.608
AUGUST 3.				
	h m s	s	° ′ ″	″
0	14 13 15.93	1.9904	−15 40 19.6	−7.608
1	14 15 15.41	1.9923	15 47 54.0	7.538
2	14 17 15.00	1.9941	15 55 24.1	7.467
3	14 19 14.70	1.9960	16 2 50.0	7.396
4	14 21 14.52	1.9980	16 10 11.6	7.324
5	14 23 14.46	1.9999	16 17 28.9	7.252
6	14 25 14.51	2.0019	16 24 41.8	7.179
7	14 27 14.69	2.0039	16 31 50.4	7.107
8	14 29 14.98	2.0059	16 38 54.6	7.033
9	14 31 15.40	2.0080	16 45 54.4	6.959
10	14 33 15.94	2.0100	16 52 49.7	6.884
11	14 35 16.60	2.0121	16 59 40.5	6.809
12	14 37 17.39	2.0143	17 6 26.8	6.734
13	14 39 18.31	2.0163	17 13 8.6	6.658
14	14 41 19.35	2.0184	17 19 45.8	6.582
15	14 43 20.52	2.0206	17 26 18.4	6.505
16	14 45 21.82	2.0228	17 32 46.4	6.428
17	14 47 23.25	2.0249	17 39 9.7	6.349
18	14 49 24.81	2.0271	17 45 28.3	6.271
19	14 51 26.50	2.0293	17 51 42.2	6.193
20	14 53 28.32	2.0315	17 57 51.4	6.113
21	14 55 30.28	2.0338	18 3 55.7	6.033
22	14 57 32.37	2.0359	18 9 55.3	5.953
23	14 59 34.59	2.0382	−18 15 50.0	−5.872
AUGUST 4.				
0	15 1 36.95	2.0404	−18 21 39.9	−5.791
1	15 3 39.44	2.0427	18 27 24.9	5.709
2	15 5 42.07	2.0450	18 33 5.0	5.627
3	15 7 44.84	2.0473	18 38 40.1	5.544
4	15 9 47.74	2.0495	18 44 10.3	5.461
5	15 11 50.78	2.0518	18 49 35.4	5.378
6	15 13 53.95	2.0541	18 54 55.6	5.293
7	15 15 57.27	2.0564	19 0 10.6	5.208
8	15 18 0.72	2.0586	19 5 20.6	5.124
9	15 20 4.30	2.0609	19 10 25.5	5.038
10	15 22 8.03	2.0633	19 15 25.2	4.952
11	15 24 11.89	2.0655	19 20 19.7	4.866
12	15 26 15.89	2.0678	19 25 9.1	4.779
13	15 28 20.03	2.0702	19 29 53.2	4.692
14	15 30 24.31	2.0724	19 34 32.1	4.604
15	15 32 28.72	2.0747	19 39 5.7	4.517
16	15 34 33.27	2.0770	19 43 34.1	4.428
17	15 36 37.96	2.0793	19 47 57.0	4.338
18	15 38 42.78	2.0815	19 52 14.7	4.249
19	15 40 47.74	2.0839	19 56 26.9	4.158
20	15 42 52.85	2.0863	20 0 33.7	4.068
21	15 44 58.09	2.0884	20 4 35.1	3.978
22	15 47 3.46	2.0907	20 8 31.1	3.887
23	15 49 8.97	2.0929	20 12 21.5	3.795
24	15 51 14.61	2.0951	−20 16 6.5	−3.70

MOON, 1919.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 5.					AUGUST 7.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 51 14.61	2.0951	−20 16 6.5	−3.703	0	17 34 3.44	2.1792	−21 21 0.5	+1.111
1	15 53 20.38	2.0973	20 19 45.9	3.611	1	17 36 14.22	2.1802	21 19 50.7	1.216
2	15 55 26.29	2.0996	20 23 19.8	3.518	2	17 38 25.06	2.1812	21 18 34.6	1.323
3	15 57 32.33	2.1018	20 26 48.1	3.424	3	17 40 35.96	2.1822	21 17 12.0	1.429
4	15 59 38.51	2.1040	20 30 10.7	3.330	4	17 42 46.92	2.1831	21 15 43.1	1.534
5	16 1 44.81	2.1062	20 33 27.7	3.237	5	17 44 57.93	2.1839	21 14 7.9	1.641
6	16 3 51.25	2.1084	20 36 39.1	3.143	6	17 47 8.99	2.1848	21 12 26.2	1.748
7	16 5 57.82	2.1105	20 39 44.8	3.048	7	17 49 20.10	2.1856	21 10 38.1	1.854
8	16 8 4.51	2.1126	20 42 44.8	2.953	8	17 51 31.26	2.1864	21 8 43.7	1.960
9	16 10 11.33	2.1148	20 45 39.1	2.858	9	17 53 42.47	2.1872	21 6 42.9	2.068
10	16 12 18.29	2.1169	20 48 27.7	2.761	10	17 55 53.72	2.1878	21 4 35.6	2.174
11	16 14 25.36	2.1190	20 51 10.4	2.664	11	17 58 5.01	2.1885	21 2 22.0	2.280
12	16 16 32.57	2.1212	20 53 47.4	2.568	12	18 0 16.34	2.1892	21 0 2.0	2.387
13	16 18 39.90	2.1232	20 56 18.6	2.471	13	18 2 27.71	2.1898	20 57 35.6	2.493
14	16 20 47.35	2.1252	20 58 43.9	2.373	14	18 4 39.11	2.1903	20 55 2.8	2.600
15	16 22 54.92	2.1272	21 1 3.4	2.275	15	18 6 50.55	2.1909	20 52 23.6	2.707
16	16 25 2.61	2.1292	21 3 16.9	2.177	16	18 9 2.02	2.1913	20 49 38.0	2.813
17	16 27 10.42	2.1312	21 5 24.6	2.079	17	18 11 13.51	2.1918	20 46 46.1	2.919
18	16 29 18.35	2.1332	21 7 26.4	1.980	18	18 13 25.03	2.1923	20 43 47.7	3.026
19	16 31 26.40	2.1351	21 9 22.2	1.881	19	18 15 36.58	2.1926	20 40 43.0	3.133
20	16 33 34.56	2.1369	21 11 12.1	1.782	20	18 17 48.14	2.1929	20 37 31.8	3.239
21	16 35 42.83	2.1388	21 12 56.0	1.682	21	18 19 59.73	2.1933	20 34 14.3	3.345
22	16 37 51.22	2.1408	21 14 33.9	1.582	22	18 22 11.34	2.1936	20 30 50.4	3.451
23	16 39 59.72	2.1426	−21 16 5.8	−1.481	23	18 24 22.96	2.1938	−20 27 20.2	+3.557
AUGUST 6.					AUGUST 8.				
0	16 42 8.33	2.1444	−21 17 31.6	−1.380	0	18 26 34.59	2.1940	−20 23 43.6	+3.663
1	16 44 17.05	2.1462	21 18 51.4	1.279	1	18 28 46.24	2.1942	20 20 0.7	3.768
2	16 46 25.87	2.1479	21 20 5.1	1.178	2	18 30 57.89	2.1943	20 16 11.4	3.874
3	16 48 34.80	2.1498	21 21 12.8	1.077	3	18 33 9.56	2.1944	20 12 15.8	3.979
4	16 50 43.84	2.1514	21 22 14.3	0.974	4	18 35 21.22	2.1945	20 8 13.9	4.084
5	16 52 52.97	2.1531	21 23 9.7	0.873	5	18 37 32.90	2.1946	20 4 5.7	4.190
6	16 55 2.21	2.1548	21 23 59.0	0.770	6	18 39 44.57	2.1945	19 59 51.1	4.295
7	16 57 11.54	2.1563	21 24 42.1	0.667	7	18 41 56.24	2.1945	19 55 30.3	4.399
8	16 59 20.97	2.1579	21 25 19.0	0.564	8	18 44 7.91	2.1944	19 51 3.2	4.504
9	17 1 30.49	2.1595	21 25 49.8	0.461	9	18 46 19.57	2.1943	19 46 29.8	4.608
10	17 3 40.11	2.1610	21 26 14.3	0.358	10	18 48 31.23	2.1943	19 41 50.2	4.712
11	17 5 49.81	2.1625	21 26 32.7	0.254	11	18 50 42.88	2.1941	19 37 4.4	4.816
12	17 7 59.61	2.1641	21 26 44.8	0.150	12	18 52 54.52	2.1939	19 32 12.3	4.920
13	17 10 9.50	2.1655	21 26 50.7	−0.047	13	18 55 6.15	2.1938	19 27 14.0	5.023
14	17 12 19.47	2.1668	21 26 50.4	+0.058	14	18 57 17.77	2.1934	19 22 9.5	5.126
15	17 14 29.52	2.1683	21 26 43.7	0.163	15	18 59 29.36	2.1932	19 16 58.9	5.228
16	17 16 39.66	2.1696	21 26 30.8	0.267	16	19 1 40.95	2.1929	19 11 42.1	5.332
17	17 18 49.87	2.1709	21 26 11.7	0.372	17	19 3 52.51	2.1925	19 6 19.1	5.433
18	17 21 0.17	2.1723	21 25 46.2	0.478	18	19 6 4.05	2.1922	19 0 50.1	5.535
19	17 23 10.54	2.1734	21 25 14.4	0.583	19	19 8 15.57	2.1918	18 55 14.9	5.638
20	17 25 20.98	2.1746	21 24 36.3	0.688	20	19 10 27.07	2.1914	18 49 33.6	5.738
21	17 27 31.49	2.1758	21 23 51.9	0.793	21	19 12 38.54	2.1909	18 43 46.3	5.838
22	17 29 42.07	2.1769	21 23 1.1	0.899	22	19 14 49.98	2.1905	18 37 53.0	5.939
23	17 31 52.72	2.1781	21 22 4.0	1.005	23	19 17 1.40	2.1900	18 31 53.6	6.040
24	17 34 3.44	2.1792	−21 21 0.5	+1.111	24	19 19 12.78	2.1895	−18 25 48.2	+6.139

MOON, 1919.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 9.					AUGUST 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 19 12.78	2.1895	−18 25 48.2	+ 6.139	0	21 3 26.08	2.1509	−11 45 57.5	+10.276
1	19 21 24.14	2.1890	18 19 36.9	6.238	1	21 5 35.11	2.1502	11 35 38.9	10.344
2	19 23 35.46	2.1853	18 13 19.6	6.338	2	21 7 44.10	2.1494	11 25 16.2	10.412
3	19 25 46.74	2.1878	18 6 56.3	6.437	3	21 9 53.04	2.1487	11 14 49.5	10.478
4	19 27 58.00	2.1873	18 0 27.2	6.534	4	21 12 1.94	2.1480	11 4 18.8	10.545
5	19 30 9.21	2.1866	17 53 52.2	6.632	5	21 14 10.80	2.1473	10 53 44.1	10.610
6	19 32 20.39	2.1860	17 47 11.4	6.729	6	21 16 19.61	2.1465	10 43 5.6	10.674
7	19 34 31.53	2.1853	17 40 24.7	6.827	7	21 18 28.38	2.1458	10 32 23.2	10.738
8	19 36 42.63	2.1847	17 33 32.2	6.923	8	21 20 37.11	2.1452	10 21 37.0	10.800
9	19 38 53.69	2.1839	17 26 34.0	7.018	9	21 22 45.80	2.1446	10 10 47.2	10.862
10	19 41 4.70	2.1832	17 19 30.0	7.113	10	21 24 54.46	2.1440	9 59 53.6	10.923
11	19 43 15.67	2.1825	17 12 20.4	7.208	11	21 27 3.08	2.1433	9 48 56.5	10.982
12	19 45 26.60	2.1818	17 5 5.0	7.303	12	21 29 11.66	2.1428	9 37 55.8	11.041
13	19 47 37.48	2.1810	16 57 44.0	7.397	13	21 31 20.21	2.1423	9 26 51.6	11.098
14	19 49 48.32	2.1803	16 50 17.4	7.490	14	21 33 28.73	2.1417	9 15 44.0	11.155
15	19 51 59.11	2.1794	16 42 45.2	7.583	15	21 35 37.21	2.1412	9 4 33.0	11.211
16	19 54 9.85	2.1786	16 35 7.5	7.674	16	21 37 45.67	2.1408	8 53 18.7	11.266
17	19 56 20.54	2.1778	16 27 24.3	7.767	17	21 39 54.10	2.1403	8 42 1.1	11.319
18	19 58 31.18	2.1769	16 19 35.5	7.858	18	21 42 2.50	2.1398	8 30 40.4	11.373
19	20 0 41.77	2.1762	16 11 41.3	7.948	19	21 44 10.87	2.1393	8 19 16.4	11.425
20	20 2 52.32	2.1753	16 3 41.7	8.038	20	21 46 19.22	2.1391	8 7 49.4	11.476
21	20 5 2.80	2.1743	15 55 36.7	8.128	21	21 48 27.56	2.1387	7 56 19.3	11.526
22	20 7 13.24	2.1736	15 47 26.4	8.216	22	21 50 35.86	2.1383	7 44 46.3	11.574
23	20 9 23.63	2.1727	−15 39 10.8	+ 8.304	23	21 52 44.16	2.1381	− 7 33 10.4	+11.623
	AUGUST 10.					AUGUST 12.			
0	20 11 33.96	2.1718	−15 30 49.9	+ 8.392	0	21 54 52.43	2.1378	− 7 21 31.6	+11.669
1	20 13 44.24	2.1709	15 22 23.8	8.478	1	21 57 0.69	2.1375	7 9 50.1	11.715
2	20 15 54.47	2.1701	15 13 52.5	8.564	2	21 59 8.93	2.1373	6 58 5.8	11.760
3	20 18 4.65	2.1692	15 5 16.1	8.650	3	22 1 17.17	2.1372	6 46 18.9	11.804
4	20 20 14.77	2.1683	14 56 34.5	8.735	4	22 3 25.39	2.1370	6 34 29.3	11.847
5	20 22 24.84	2.1674	14 47 47.9	8.818	5	22 5 33.61	2.1369	6 22 37.3	11.888
6	20 24 34.86	2.1665	14 38 56.3	8.902	6	22 7 41.82	2.1368	6 10 42.7	11.929
7	20 26 44.82	2.1656	14 29 59.7	8.985	7	22 9 50.03	2.1368	5 58 45.8	11.968
8	20 28 54.73	2.1647	14 20 58.1	9.068	8	22 11 58.23	2.1368	5 46 46.5	12.007
9	20 31 4.58	2.1638	14 11 51.6	9.148	9	22 14 6.44	2.1368	5 34 45.0	12.044
10	20 33 14.38	2.1628	14 2 40.3	9.228	10	22 16 14.65	2.1369	5 22 41.2	12.082
11	20 35 24.12	2.1619	13 53 24.2	9.308	11	22 18 22.87	2.1370	5 10 35.2	12.117
12	20 37 33.81	2.1611	13 44 3.3	9.388	12	22 20 31.09	2.1371	4 58 27.2	12.150
13	20 39 43.45	2.1603	13 34 37.7	9.466	13	22 22 39.32	2.1373	4 46 17.2	12.184
14	20 41 53.04	2.1593	13 25 7.4	9.543	14	22 24 47.56	2.1375	4 34 5.1	12.217
15	20 44 2.57	2.1584	13 15 32.5	9.620	15	22 26 55.82	2.1378	4 21 51.2	12.247
16	20 46 12.05	2.1576	13 5 53.0	9.697	16	22 29 4.09	2.1380	4 9 35.5	12.277
17	20 48 21.48	2.1568	12 56 8.9	9.773	17	22 31 12.38	2.1383	3 57 18.0	12.305
18	20 50 30.86	2.1559	12 46 20.3	9.846	18	22 33 20.69	2.1387	3 44 58.9	12.333
19	20 52 40.19	2.1551	12 36 27.4	9.919	19	22 35 29.02	2.1391	3 32 38.1	12.360
20	20 54 49.47	2.1542	12 26 30.0	9.993	20	22 37 37.38	2.1395	3 20 15.7	12.385
21	20 56 58.69	2.1533	12 16 28.3	10.065	21	22 39 45.76	2.1400	3 7 51.9	12.409
22	20 59 7.87	2.1526	12 6 22.2	10.136	22	22 41 54.18	2.1405	2 55 26.6	12.433
23	21 1 17.00	2.1518	11 56 12.0	10.206	23	22 44 2.62	2.1410	2 43 0.0	12.454
24	21 3 26.08	2.1509	−11 45 57.5	+10.276	24	22 46 11.10	2.1417	− 2 30 32.1	+12.475

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 13.			
	h m s	s	° ′ ″	″
0	22 46 11.10	2.1417	−2 30 32.1	+12.475
1	22 48 19.62	2.1423	2 18 3.0	12.495
2	22 50 28.18	2.1430	2 5 32.7	12.513
3	22 52 36.78	2.1437	1 53 1.4	12.531
4	22 54 45.42	2.1444	1 40 29.0	12.548
5	22 56 54.11	2.1453	1 27 55.7	12.562
6	22 59 2.85	2.1461	1 15 21.6	12.576
7	23 1 11.64	2.1470	1 2 46.6	12.588
8	23 3 20.49	2.1480	0 50 11.0	12.600
9	23 5 29.40	2.1489	0 37 34.6	12.611
10	23 7 38.36	2.1499	0 24 57.7	12.619
11	23 9 47.39	2.1510	−0 12 20.3	12.628
12	23 11 56.48	2.1521	+0 0 17.6	12.634
13	23 14 5.64	2.1533	0 12 55.8	12.640
14	23 16 14.87	2.1544	0 25 34.4	12.645
15	23 18 24.17	2.1557	0 38 13.2	12.648
16	23 20 33.55	2.1569	0 50 52.1	12.649
17	23 22 43.00	2.1583	1 3 31.1	12.650
18	23 24 52.54	2.1597	1 16 10.1	12.649
19	23 27 2.16	2.1611	1 28 49.0	12.648
20	23 29 11.87	2.1625	1 41 27.9	12.646
21	23 31 21.66	2.1640	1 54 6.5	12.641
22	23 33 31.55	2.1656	2 6 44.8	12.636
23	23 35 41.53	2.1672	+2 19 22.8	+12.629
	AUGUST 14.			
0	23 37 51.61	2.1688	+2 32 0.3	+12.621
1	23 40 1.79	2.1705	2 44 37.3	12.613
2	23 42 12.07	2.1723	2 57 13.8	12.603
3	23 44 22.46	2.1741	3 9 49.6	12.590
4	23 46 32.96	2.1758	3 22 24.6	12.578
5	23 48 43.56	2.1777	3 34 58.9	12.564
6	23 50 54.28	2.1797	3 47 32.3	12.548
7	23 53 5.12	2.1816	4 0 4.7	12.533
8	23 55 16.07	2.1836	4 12 36.2	12.515
9	23 57 27.15	2.1856	4 25 6.5	12.495
10	23 59 38.34	2.1877	4 37 35.6	12.475
11	0 1 49.67	2.1898	4 50 3.5	12.454
12	0 4 1.12	2.1919	5 2 30.1	12.432
13	0 6 12.70	2.1942	5 14 55.3	12.408
14	0 8 24.42	2.1965	5 27 19.0	12.382
15	0 10 36.28	2.1988	5 39 41.1	12.355
16	0 12 48.27	2.2011	5 52 1.6	12.328
17	0 15 0.41	2.2035	6 4 20.4	12.298
18	0 17 12.69	2.2059	6 16 37.4	12.268
19	0 19 25.12	2.2083	6 28 52.6	12.237
20	0 21 37.69	2.2109	6 41 5.8	12.203
21	0 23 50.43	2.2135	6 53 17.0	12.169
22	0 26 3.31	2.2160	7 5 26.1	12.134
23	0 28 16.35	2.2187	7 17 33.1	12.098
24	0 30 29.55	2.2213	+7 29 37.8	+12.059

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 15.			
	h m s	s	° ′ ″	″
0	0 30 29.55	2.2213	+ 7 29 37.8	+12.059
1	0 32 42.91	2.2241	7 41 40.2	12.020
2	0 34 56.44	2.2268	7 53 40.2	11.979
3	0 37 10.13	2.2296	8 5 37.7	11.938
4	0 39 23.99	2.2324	8 17 32.7	11.895
5	0 41 38.02	2.2353	8 29 25.1	11.851
6	0 43 52.22	2.2382	8 41 14.8	11.805
7	0 46 6.60	2.2411	8 53 1.7	11.758
8	0 48 21.15	2.2440	9 4 45.7	11.709
9	0 50 35.88	2.2471	9 16 26.8	11.661
10	0 52 50.80	2.2501	9 28 5.0	11.610
11	0 55 5.89	2.2531	9 39 40.0	11.558
12	0 57 21.17	2.2563	9 51 11.9	11.504
13	0 59 36.64	2.2593	10 2 40.5	11.450
14	1 1 52.29	2.2625	10 14 5.9	11.394
15	1 4 8.14	2.2658	10 25 27.8	11.337
16	1 6 24.18	2.2689	10 36 46.3	11.278
17	1 8 40.41	2.2722	10 48 1.2	11.218
18	1 10 56.84	2.2755	10 59 12.5	11.158
19	1 13 13.47	2.2788	11 10 20.2	11.096
20	1 15 30.30	2.2821	11 21 24.0	11.032
21	1 17 47.32	2.2854	11 32 24.0	10.968
22	1 20 4.55	2.2888	11 43 20.1	10.902
23	1 22 21.98	2.2923	+11 54 12.2	+10.834
	AUGUST 16.			
0	1 24 39.62	2.2957	+12 5 0.2	+10.766
1	1 26 57.46	2.2991	12 15 44.1	10.696
2	1 29 15.51	2.3026	12 26 23.7	10.624
3	1 31 33.77	2.3061	12 36 59.0	10.553
4	1 33 52.24	2.3096	12 47 30.0	10.479
5	1 36 10.92	2.3132	12 57 56.5	10.404
6	1 38 29.82	2.3167	13 8 18.5	10.328
7	1 40 48.92	2.3202	13 18 35.8	10.250
8	1 43 8.24	2.3238	13 28 48.5	10.173
9	1 45 27.77	2.3273	13 38 56.5	10.093
10	1 47 47.52	2.3309	13 48 59.7	10.012
11	1 50 7.48	2.3345	13 58 57.9	9.929
12	1 52 27.66	2.3382	14 8 51.2	9.847
13	1 54 48.06	2.3418	14 18 39.5	9.762
14	1 57 8.67	2.3453	14 28 22.6	9.675
15	1 59 29.50	2.3490	14 38 0.5	9.588
16	2 1 50.55	2.3526	14 47 33.2	9.501
17	2 4 11.81	2.3563	14 57 0.6	9.412
18	2 6 33.30	2.3599	15 6 22.6	9.320
19	2 8 55.00	2.3634	15 15 39.0	9.228
20	2 11 16.91	2.3671	15 24 50.0	9.136
21	2 13 39.05	2.3708	15 33 55.3	9.042
22	2 16 1.40	2.3743	15 42 55.0	8.947
23	2 18 23.97	2.3779	15 51 48.9	8.850
24	2 20 46.75	2.3815	+16 0 37.0	+ 8.753

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 17.					AUGUST 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 20 46.75	2.3815	+16 0 37.0	+8.753	0	4 18 42.66	2.5140	+20 49 14.7	+2.953
1	2 23 9.75	2.3852	16 9 19.2	8.654	1	4 21 13.54	2.5153	20 52 7.7	2.814
2	2 25 32.97	2.3888	16 17 55.5	8.554	2	4 23 44.50	2.5167	20 54 52.4	2.676
3	2 27 56.40	2.3923	16 26 25.7	8.453	3	4 26 15.54	2.5178	20 57 28.8	2.538
4	2 30 20.04	2.3958	16 34 49.9	8.352	4	4 28 46.63	2.5188	20 59 56.9	2.398
5	2 32 43.90	2.3994	16 43 7.9	8.248	5	4 31 17.79	2.5198	21 2 16.6	2.258
6	2 35 7.97	2.4029	16 51 19.7	8.144	6	4 33 49.00	2.5206	21 4 27.9	2.119
7	2 37 32.25	2.4064	16 59 25.2	8.038	7	4 36 20.26	2.5214	21 6 30.9	1.980
8	2 39 56.74	2.4099	17 7 24.3	7.932	8	4 38 51.57	2.5222	21 8 25.5	1.839
9	2 42 21.44	2.4133	17 15 17.0	7.825	9	4 41 22.92	2.5228	21 10 11.6	1.699
10	2 44 46.34	2.4168	17 23 3.3	7.717	10	4 43 54.31	2.5233	21 11 49.4	1.559
11	2 47 11.45	2.4202	17 30 43.0	7.607	11	4 46 25.72	2.5238	21 13 18.7	1.418
12	2 49 36.76	2.4236	17 38 16.1	7.497	12	4 48 57.16	2.5242	21 14 39.5	1.277
13	2 52 2.28	2.4270	17 45 42.6	7.385	13	4 51 28 62	2.5244	21 15 51.9	1.136
14	2 54 28.00	2.4303	17 53 2.3	7.272	14	4 54 0.09	2.5246	21 16 55.8	0.995
15	2 56 53.91	2.4335	18 0 15.2	7.158	15	4 56 31.57	2.5247	21 17 51.3	0.854
16	2 59 20.02	2.4368	18 7 21.3	7.045	16	4 59 3.05	2.5247	21 18 38.3	0.713
17	3 1 46.33	2.4401	18 14 20.6	6.929	17	5 1 34.53	2.5247	21 19 16.8	0.571
18	3 4 12.83	2.4433	18 21 12.8	6.812	18	5 4 6.01	2.5245	21 19 46.8	0.430
19	3 6 39.52	2.4463	18 27 58.0	6.695	19	5 6 37.47	2.5242	21 20 8.4	0.289
20	3 9 6.39	2.4494	18 34 36.2	6.577	20	5 9 8.91	2.5238	21 20 21.5	0.148
21	3 11 33.45	2.4526	18 41 7.2	6.458	21	5 11 40.33	2.5233	21 20 26.1	+0.007
22	3 14 0.70	2.4556	18 47 31.1	6.338	22	5 14 11.71	2.5228	21 20 22.3	−0.134
23	3 16 28.12	2.4585	+18 53 47.7	+6.216	23	5 16 43.07	2.5223	+21 20 10.0	−0.275
	AUGUST 18.					AUGUST 20.			
0	3 18 55.72	2.4615	+18 59 57.0	+6.094	0	5 19 14.38	2.5215	+21 19 49.3	−0.416
1	3 21 23.50	2.4644	19 5 59.0	5.972	1	5 21 45.65	2.5207	21 19 20.1	0.557
2	3 23 51.45	2.4672	19 11 53.6	5.848	2	5 24 16.86	2.5198	21 18 42.5	0.698
3	3 26 19.56	2.4700	19 17 40.7	5.723	3	5 26 48.02	2.5188	21 17 56.4	0.838
4	3 28 47.85	2.4728	19 23 20.3	5.598	4	5 29 19.12	2.5178	21 17 2.0	0.978
5	3 31 16.29	2.4753	19 28 52.5	5.473	5	5 31 50.15	2.5166	21 15 59.1	1.118
6	3 33 44.89	2.4780	19 34 17.0	5.345	6	5 34 21.11	2.5153	21 14 47.9	1.257
7	3 36 13.65	2.4807	19 39 33.9	5.218	7	5 36 51.99	2.5140	21 13 28.3	1.396
8	3 38 42.57	2.4832	19 44 43.1	5.089	8	5 39 22.79	2.5126	21 12 0.4	1.535
9	3 41 11.63	2.4855	19 49 44.6	4.961	9	5 41 53.50	2.5110	21 10 24.1	1.673
10	3 43 40.83	2.4879	19 54 38.4	4.831	10	5 44 24.11	2.5094	21 8 39.6	1.812
11	3 46 10.18	2.4903	19 59 24.3	4.700	11	5 46 54.63	2.5078	21 6 46.7	1.949
12	3 48 39.66	2.4925	20 4 2.4	4.569	12	5 49 25.04	2.5059	21 4 45.7	2.086
13	3 51 9.28	2.4948	20 8 32.6	4.438	13	5 51 55.34	2.5041	21 2 36.4	2.223
14	3 53 39.03	2.4968	20 12 54.9	4.305	14	5 54 25.53	2.5022	21 0 18.9	2.360
15	3 56 8.90	2.4988	20 17 9.2	4.173	15	5 56 55.60	2.5002	20 57 53.2	2.497
16	3 58 38.89	2.5008	20 21 15.6	4.039	16	5 59 25.55	2.4980	20 55 19.3	2.633
17	4 1 9.00	2.5028	20 25 13.9	3.905	17	6 1 55.36	2.4958	20 52 37.3	2.767
18	4 3 39.22	2.5046	20 29 4.2	3.770	18	6 4 25.05	2.4936	20 49 47.3	2.901
19	4 6 9.55	2.5063	20 32 46.3	3.635	19	6 6 54.59	2.4912	20 46 49.2	3.035
20	4 8 39.98	2.5080	20 36 20.4	3.499	20	6 9 23.99	2.4888	20 43 43.1	3.168
21	4 11 10.51	2.5097	20 39 46.2	3.363	21	6 11 53.24	2.4863	20 40 29.0	3.301
22	4 13 41.14	2.5113	20 43 3.9	3.227	22	6 14 22.34	2.4837	20 37 7.0	3.433
23	4 16 11.86	2.5127	20 46 13.4	3.090	23	6 16 51.28	2.4810	20 33 37.0	3.565
24	4 18 42.66	2.5140	+20 49 14.7	+2.953	24	6 19 20.06	2.4783	+20 29 59.2	−3.695

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 21.					AUGUST 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 19 20.06	2.4783	+20 29 59.2	−3.695	0	8 14 4.73	2.2884	+15 18 28.6	− 8.889
1	6 21 48.67	2.4755	20 26 13.6	3.826	1	8 16 21.90	2.2838	15 9 32.8	8.970
2	6 24 17.12	2.4727	20 22 20.1	3.955	2	8 18 38.79	2.2793	15 0 32.2	9.050
3	6 26 45.39	2.4697	20 18 19.0	4.083	3	8 20 55.41	2.2748	14 51 26.8	9.129
4	6 29 13.48	2.4666	20 14 10.1	4.212	4	8 23 11.76	2.2702	14 42 16.7	9.207
5	6 31 41.38	2.4635	20 9 53.6	4.338	5	8 25 27.83	2.2656	14 33 2.0	9.283
6	6 34 9.10	2.4604	20 5 29.5	4.465	6	8 27 43.63	2.2611	14 23 42.8	9.358
7	6 36 36.63	2.4573	20 0 57.8	4.591	7	8 29 59.16	2.2566	14 14 19.1	9.432
8	6 39 3.97	2.4540	19 56 18.6	4.716	8	8 32 14.42	2.2520	14 4 51.0	9.504
9	6 41 31.11	2.4506	19 51 31.9	4.839	9	8 34 29.40	2.2475	13 55 18.6	9.575
10	6 43 58.04	2.4472	19 46 37.9	4.963	10	8 36 44.12	2.2430	13 45 42.0	9.646
11	6 46 24.77	2.4438	19 41 36.4	5.085	11	8 38 58.56	2.2385	13 36 1.1	9.715
12	6 48 51.29	2.4403	19 36 27.7	5.206	12	8 41 12.74	2.2341	13 26 16.2	9.782
13	6 51 17.60	2.4367	19 31 11.7	5.327	13	8 43 26.65	2.2296	13 16 27.3	9.848
14	6 53 43.69	2.4330	19 25 48.5	5.447	14	8 45 40.29	2.2251	13 6 34.4	9.914
15	6 56 9.56	2.4293	19 20 18.1	5.565	15	8 47 53.66	2.2206	12 56 37.6	9.978
16	6 58 35.20	2.4256	19 14 40.7	5.683	16	8 50 6.76	2.2163	12 46 37.0	10.041
17	7 1 0.63	2.4218	19 8 56.2	5.800	17	8 52 19.61	2.2118	12 36 32.7	10.102
18	7 3 25.82	2.4179	19 3 4.7	5.916	18	8 54 32.18	2.2074	12 26 24.8	10.163
19	7 5 50.78	2.4141	18 57 6.3	6.030	19	8 56 44.50	2.2031	12 16 13.2	10.222
20	7 8 15.51	2.4103	18 51 1.1	6.144	20	8 58 56.55	2.1987	12 5 58.2	10.280
21	7 10 40.01	2.4063	18 44 49.0	6.257	21	9 1 8.34	2.1944	11 55 39.6	10.337
22	7 13 4.26	2.4022	18 38 30.2	6.368	22	9 3 19.88	2.1901	11 45 17.8	10.392
23	7 15 28.27	2.3982	+18 32 4.8	−6.479	23	9 5 31.15	2.1858	+11 34 52.6	−10.447
	AUGUST 22.					AUGUST 24.			
0	7 17 52.04	2.3941	+18 25 32.7	−6.589	0	9 7 42.17	2.1816	+11 24 24.2	−10.499
1	7 20 15.56	2.3900	18 18 54.1	6.698	1	9 9 52.94	2.1773	11 13 52.7	10.551
2	7 22 38.84	2.3858	18 12 9.0	6.806	2	9 12 3.45	2.1731	11 3 18.1	10.602
3	7 25 1.86	2.3816	18 5 17.4	6.913	3	9 14 13.71	2.1689	10 52 40.5	10.651
4	7 27 24.63	2.3773	17 58 19.5	7.018	4	9 16 23.72	2.1648	10 42 0.0	10.700
5	7 29 47.14	2.3731	17 51 15.3	7.123	5	9 18 33.49	2.1607	10 31 16.5	10.748
6	7 32 9.40	2.3689	17 44 4.8	7.226	6	9 20 43.00	2.1566	10 20 30.3	10.793
7	7 34 31.41	2.3646	17 36 48.2	7.328	7	9 22 52.28	2.1526	10 9 41.4	10.837
8	7 36 53.15	2.3602	17 29 25.5	7.428	8	9 25 1.31	2.1485	9 58 49.9	10.881
9	7 39 14.63	2.3558	17 21 56.8	7.528	9	9 27 10.10	2.1445	9 47 55.7	10.923
10	7 41 35.85	2.3514	17 14 22.1	7.628	10	9 29 18.65	2.1405	9 36 59.1	10.964
11	7 43 56.80	2.3470	17 6 41.4	7.726	11	9 31 26.96	2.1366	9 26 0.0	11.005
12	7 46 17.49	2.3426	16 58 55.0	7.822	12	9 33 35.04	2.1328	9 14 58.5	11.043
13	7 48 37.91	2.3382	16 51 2.8	7.918	13	9 35 42.89	2.1288	9 3 54.8	11.081
14	7 50 58.07	2.3337	16 43 4.9	8.012	14	9 37 50.50	2.1250	8 52 48.8	11.118
15	7 53 17.95	2.3292	16 35 1.4	8.105	15	9 39 57.89	2.1213	8 41 40.7	11.152
16	7 55 37.57	2.3247	16 26 52.3	8.197	16	9 42 5.05	2.1175	8 30 30.6	11.186
17	7 57 56.91	2.3202	16 18 37.8	8.287	17	9 44 11.99	2.1138	8 19 18.4	11.220
18	8 0 15.99	2.3158	16 10 17.9	8.377	18	9 46 18.71	2.1102	8 8 4.2	11.252
19	8 2 34.80	2.3112	16 1 52.6	8.466	19	9 48 25.21	2.1065	7 56 48.2	11.283
20	8 4 53.33	2.3066	15 53 22.0	8.553	20	9 50 31.49	2.1029	7 45 30.3	11.313
21	8 7 11.59	2.3021	15 44 46.3	8.638	21	9 52 37.56	2.0993	7 34 10.7	11.341
22	8 9 29.58	2.2975	15 36 5.4	8.723	22	9 54 43.41	2.0958	7 22 49.4	11.368
23	8 11 47.29	2.2929	15 27 19.5	8.807	23	9 56 49.05	2.0923	7 11 26.5	11.395
24	8 14 4.73	2.2884	+15 18 28.6	−8.889	24	9 58 54.49	2.0889	+ 7 0 2.0	−11.420

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 25.					AUGUST 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 58 54.49	2.0889	+7 0 2.0	−11.420	0	11 36 1.77	1.9753	− 2 17 35.3	−11.448
1	10 0 59.72	2.0854	6 48 36.1	11.443	1	11 38 0.25	1.9741	2 29 1.6	11.428
2	10 3 4.74	2.0821	6 37 8.8	11.467	2	11 39 58.66	1.9728	2 40 26.6	11.405
3	10 5 9.57	2.0788	6 25 40.1	11.488	3	11 41 56.99	1.9717	2 51 50.2	11.382
4	10 7 14.19	2.0754	6 14 10.2	11.509	4	11 43 55.26	1.9707	3 3 12.4	11.358
5	10 9 18.62	2.0723	6 2 39.0	11.529	5	11 45 53.47	1.9696	3 14 33.1	11.333
6	10 11 22.86	2.0691	5 51 6.7	11.548	6	11 47 51.61	1.9685	3 25 52.4	11.308
7	10 13 26.91	2.0659	5 39 33.2	11.566	7	11 49 49.69	1.9675	3 37 10.1	11.282
8	10 15 30.77	2.0628	5 27 58.8	11.583	8	11 51 47.71	1.9666	3 48 26.2	11.255
9	10 17 34.44	2.0597	5 16 23.3	11.598	9	11 53 45.68	1.9658	3 59 40.7	11.228
10	10 19 37.93	2.0567	5 4 47.0	11.613	10	11 55 43.60	1.9649	4 10 53.5	11.198
11	10 21 41.24	2.0537	4 53 9.8	11.626	11	11 57 41.47	1.9641	4 22 4.5	11.169
12	10 23 44.37	2.0508	4 41 31.9	11.638	12	11 59 39.29	1.9633	4 33 13.8	11.140
13	10 25 47.33	2.0478	4 29 53.3	11.649	13	12 1 37.07	1.9626	4 44 21.3	11.108
14	10 27 50.11	2.0450	4 18 14.0	11.660	14	12 3 34.80	1.9619	4 55 26.8	11.077
15	10 29 52.73	2.0422	4 6 34.1	11.669	15	12 5 32.50	1.9613	5 6 30.5	11.046
16	10 31 55.17	2.0394	3 54 53.7	11.678	16	12 7 30.16	1.9608	5 17 32.3	11.013
17	10 33 57.46	2.0368	3 43 12.8	11.685	17	12 9 27.79	1.9603	5 28 32.0	10.978
18	10 35 59.58	2.0340	3 31 31.5	11.691	18	12 11 25.39	1.9598	5 39 29.7	10.941
19	10 38 1.54	2.0314	3 19 49.9	11.696	19	12 13 22.96	1.9593	5 50 25.3	10.910
20	10 40 3.35	2.0288	3 8 8.0	11.701	20	12 15 20.50	1.9588	6 1 18.9	10.874
21	10 42 5.00	2.0263	2 56 25.8	11.704	21	12 17 18.02	1.9585	6 12 10.2	10.838
22	10 44 6.50	2.0238	2 44 43.5	11.706	22	12 19 15.52	1.9582	6 22 59.4	10.801
23	10 46 7.86	2.0214	+2 33 1.1	−11.708	23	12 21 13.00	1.9578	− 6 33 46.3	−10.763
	AUGUST 26.					AUGUST 28.			
0	10 48 9.07	2.0190	+2 21 18.6	−11.708	0	12 23 10.46	1.9576	− 6 44 30.9	−10.724
1	10 50 10.14	2.0167	2 9 36.1	11.708	1	12 25 7.91	1.9574	6 55 13.2	10.685
2	10 52 11.07	2.0143	1 57 53.6	11.707	2	12 27 5.35	1.9573	7 5 53.1	10.646
3	10 54 11.86	2.0121	1 46 11.3	11.704	3	12 29 2.78	1.9571	7 16 30.7	10.605
4	10 56 12.52	2.0099	1 34 29.1	11.701	4	12 31 0.20	1.9570	7 27 5.7	10.563
5	10 58 13.05	2.0078	1 22 47.2	11.697	5	12 32 57.62	1.9569	7 37 38.3	10.523
6	11 0 13.45	2.0056	1 11 5.5	11.692	6	12 34 55.03	1.9569	7 48 8.4	10.480
7	11 2 13.72	2.0035	0 59 24.2	11.685	7	12 36 52.45	1.9570	7 58 35.9	10.437
8	11 4 13.87	2.0015	0 47 43.3	11.678	8	12 38 49.87	1.9571	8 9 0.8	10.393
9	11 6 13.90	1.9995	0 36 2.8	11.671	9	12 40 47.30	1.9572	8 19 23.1	10.349
10	11 8 13.81	1.9976	0 24 22.8	11.662	10	12 42 44.73	1.9573	8 29 42.7	10.303
11	11 10 13.61	1.9957	0 12 43.4	11.652	11	12 44 42.17	1.9575	8 39 59.5	10.258
12	11 12 13.29	1.9938	+0 1 4.6	11.642	12	12 46 39.63	1.9578	8 50 13.6	10.212
13	11 14 12.86	1.9920	−0 10 33.6	11.630	13	12 48 37.10	1.9580	9 0 24.9	10.164
14	11 16 12.33	1.9903	0 22 11.0	11.618	14	12 50 34.59	1.9583	9 10 33.3	10.117
15	11 18 11.69	1.9886	0 33 47.7	11.605	15	12 52 32.10	1.9587	9 20 38.9	10.069
16	11 20 10.96	1.9870	0 45 23.6	11.591	16	12 54 29.63	1.9590	9 30 41.6	10.020
17	11 22 10.13	1.9853	0 56 58.6	11.576	17	12 56 27.18	1.9594	9 40 41.3	9.970
18	11 24 9.19	1.9837	1 8 32.7	11.561	18	12 58 24.76	1.9598	9 50 38.0	9.921
19	11 26 8.17	1.9823	1 20 5.9	11.544	19	13 0 22.36	1.9603	10 0 31.8	9.870
20	11 28 7.06	1.9808	1 31 38.0	11.526	20	13 2 20.00	1.9608	10 10 22.4	9.818
21	11 30 5.86	1.9793	1 43 9.0	11.508	21	13 4 17.66	1.9614	10 20 10.0	9.768
22	11 32 4.58	1.9779	1 54 39.0	11.490	22	13 6 15.37	1.9620	10 29 54.5	9.715
23	11 34 3.21	1.9766	2 6 7.8	11.469	23	13 8 13.10	1.9626	10 39 35.8	9.662
24	11 36 1.77	1.9753	−2 17 35.3	−11.448	24	13 10 10.88	1.9633	−10 49 13.9	

MOON, 1919.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 29.			
	h m s	s	° ′ ″	″
0	13 10 10.88	1.9633	−10 49 13.9	−9.608
1	13 12 8.70	1.9639	10 58 48.8	9.554
2	13 14 6.55	1.9647	11 8 20.4	9.499
3	13 16 4.46	1.9655	11 17 48.7	9.444
4	13 18 2.41	1.9662	11 27 13.7	9.388
5	13 20 0.40	1.9670	11 36 35.3	9.332
6	13 21 58.45	1.9678	11 45 53.5	9.275
7	13 23 56.54	1.9688	11 55 8.3	9.218
8	13 25 54.70	1.9697	12 4 19.6	9.159
9	13 27 52.90	1.9706	12 13 27.4	9.100
10	13 29 51.17	1.9716	12 22 31.6	9.041
11	13 31 49.49	1.9725	12 31 32.3	8.982
12	13 33 47.87	1.9736	12 40 29.4	8.921
13	13 35 46.32	1.9746	12 49 22.8	8.860
14	13 37 44.82	1.9757	12 58 12.6	8.799
15	13 39 43.40	1.9768	13 6 58.7	8.737
16	13 41 42.04	1.9779	13 15 41.0	8.674
17	13 43 40.75	1.9791	13 24 19.6	8.612
18	13 45 39.53	1.9803	13 32 54.4	8.548
19	13 47 38.38	1.9815	13 41 25.4	8.484
20	13 49 37.31	1.9828	13 49 52.5	8.419
21	13 51 36.31	1.9840	13 58 15.7	8.354
22	13 53 35.39	1.9853	14 6 35.0	8.288
23	13 55 34.55	1.9867	−14 14 50.3	−8.223
	AUGUST 30.			
0	13 57 33.79	1.9880	−14 23 1.7	−8.156
1	13 59 33.11	1.9893	14 31 9.0	8.088
2	14 1 32.51	1.9907	14 39 12.3	8.022
3	14 3 31.99	1.9921	14 47 11.6	7.953
4	14 5 31.56	1.9936	14 55 6.7	7.884
5	14 7 31.22	1.9950	15 2 57.7	7.815
6	14 9 30.96	1.9964	15 10 44.5	7.745
7	14 11 30.79	1.9979	15 18 27.1	7.675
8	14 13 30.71	1.9995	15 26 5.5	7.605
9	14 15 30.73	2.0010	15 33 39.7	7.534
10	14 17 30.83	2.0025	15 41 9.6	7.463
11	14 19 31.03	2.0041	15 48 35.2	7.390
12	14 21 31.32	2.0057	15 55 56.4	7.318
13	14 23 31.71	2.0073	16 3 13.3	7.244
14	14 25 32.19	2.0088	16 10 25.7	7.171
15	14 27 32.77	2.0105	16 17 33.8	7.097
16	14 29 33.45	2.0122	16 24 37.3	7.022
17	14 31 34.23	2.0138	16 31 36.4	6.948
18	14 33 35.10	2.0154	16 38 31.0	6.873
19	14 35 36.08	2.0172	16 45 21.1	6.797
20	14 37 37.16	2.0189	16 52 6.6	6.720
21	14 39 38.35	2.0206	16 58 47.5	6.643
22	14 41 39.63	2.0223	17 5 23.7	6.566
23	14 43 41.02	2.0241	17 11 55.4	6.488
24	*14 45 42.52*	2.0258	−17 18 22.3	−6.410

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 31.			
	h m s	s	° ′ ″	″
0	14 45 42.52	2.0258	−17 18 22.3	−6.410
1	14 47 44.12	2.0276	17 24 44.6	6.332
2	14 49 45.83	2.0293	17 31 2.1	6.252
3	14 51 47.64	2.0311	17 37 14.8	6.173
4	14 53 49.56	2.0329	17 43 22.8	6.093
5	14 55 51.59	2.0348	17 49 26.0	6.013
6	14 57 53.73	2.0366	17 55 24.3	5.932
7	14 59 55.98	2.0383	18 1 17.8	5.851
8	15 1 58.33	2.0401	18 7 6.4	5.769
9	15 4 0.79	2.0419	18 12 50.1	5.687
10	15 6 3.36	2.0438	18 18 28.8	5.604
11	15 8 6.05	2.0457	18 24 2.6	5.522
12	15 10 8.84	2.0474	18 29 31.4	5.438
13	15 12 11.74	2.0493	18 34 55.2	5.355
14	15 14 14.76	2.0512	18 40 14.0	5.270
15	15 16 17.88	2.0530	18 45 27.6	5.185
16	15 18 21.12	2.0549	18 50 36.2	5.101
17	15 20 24.47	2.0568	18 55 39.7	5.016
18	15 22 27.93	2.0586	19 0 38.1	4.930
19	15 24 31.50	2.0604	19 5 31.3	4.844
20	15 26 35.18	2.0623	19 10 19.4	4.758
21	15 28 38.97	2.0641	19 15 2.2	4.670
22	15 30 42.87	2.0660	19 19 39.8	4.583
23	15 32 46.89	2.0678	−19 24 12.1	−4.495
	SEPTEMBER 1.			
0	15 34 51.01	2.0697	−19 28 39.2	−4.408
1	15 36 55.25	2.0715	19 33 1.0	4.318
2	15 38 59.59	2.0733	19 37 17.4	4.229
3	15 41 4.05	2.0753	19 41 28.5	4.141
4	15 43 8.62	2.0770	19 45 34.3	4.051
5	15 45 13.29	2.0788	19 49 34.6	3.961
6	15 47 18.08	2.0807	19 53 29.6	3.871
7	15 49 22.97	2.0824	19 57 19.1	3.779
8	15 51 27.97	2.0843	20 1 3.1	3.688
9	15 53 33.08	2.0861	20 4 41.7	3.598
10	15 55 38.30	2.0879	20 8 14.8	3.506
11	15 57 43.63	2.0897	20 11 42.4	3.413
12	15 59 49.06	2.0914	20 15 4.4	3.321
13	16 1 54.60	2.0932	20 18 20.9	3.228
14	16 4 0.24	2.0949	20 21 31.8	3.135
15	16 6 5.99	2.0967	20 24 37.1	3.042
16	16 8 11.84	2.0983	20 27 36.8	2.948
17	16 10 17.79	2.1001	20 30 30.9	2.854
18	16 12 23.85	2.1018	20 33 19.3	2.760
19	16 14 30.01	2.1035	20 36 2.1	2.666
20	16 16 36.27	2.1052	20 38 39.2	2.570
21	16 18 42.63	2.1068	20 41 10.5	2.475
22	16 20 49.09	2.1084	20 43 36.2	2.380
23	16 22 55.64	2.1101	20 45 56.1	2.283
24	16 25 2.30	2.1118	−20 48 10.2	−2.188

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 2.					SEPTEMBER 4.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 25 2.30	2.1118	−20 48 10.2	−2.188	0	18 7 53.53	2.1650	−20 38 11.9	+2.660
1	16 27 9.05	2.1133	20 50 18.6	2.091	1	18 10 3.45	2.1655	20 35 29.2	2.763
2	16 29 15.90	2.1150	20 52 21.1	1.993	2	18 12 13.39	2.1660	20 32 40.4	2.865
3	16 31 22.85	2.1165	20 54 17.8	1.897	3	18 14 23.37	2.1665	20 29 45.4	2.968
4	16 33 29.88	2.1181	20 56 8.8	1.800	4	18 16 33.37	2.1669	20 26 44.2	3.073
5	16 35 37.02	2.1197	20 57 53.8	1.702	5	18 18 43.40	2.1673	20 23 36.7	3.175
6	16 37 44.24	2.1211	20 59 33.0	1.605	6	18 20 53.45	2.1678	20 20 23.2	3.278
7	16 39 51.55	2.1226	21 1 6.4	1.508	7	18 23 3.53	2.1682	20 17 3.4	3.382
8	16 41 58.95	2.1242	21 2 33.9	1.408	8	18 25 13.63	2.1685	20 13 37.4	3.484
9	16 44 6.45	2.1257	21 3 55.4	1.309	9	18 27 23.75	2.1688	20 10 5.3	3.587
10	16 46 14.03	2.1270	21 5 11.0	1.211	10	18 29 33.89	2.1692	20 6 27.0	3.689
11	16 48 21.69	2.1284	21 6 20.7	1.113	11	18 31 44.05	2.1694	20 2 42.6	3.792
12	16 50 29.44	2.1298	21 7 24.5	1.013	12	18 33 54.22	2.1697	19 58 52.0	3.894
13	16 52 37.27	2.1313	21 8 22.3	0.913	13	18 36 4.41	2.1699	19 54 55.3	3.997
14	16 54 45.19	2.1327	21 9 14.1	0.814	14	18 38 14.61	2.1701	19 50 52.4	4.099
15	16 56 53.19	2.1339	21 10 0.0	0.714	15	18 40 24.82	2.1703	19 46 43.4	4.201
16	16 59 1.26	2.1353	21 10 39.8	0.614	16	18 42 35.04	2.1705	19 42 28.3	4.303
17	17 1 9.42	2.1366	21 11 13.7	0.513	17	18 44 45.28	2.1707	19 38 7.1	4.405
18	17 3 17.65	2.1378	21 11 41.4	0.413	18	18 46 55.52	2.1708	19 33 39.7	4.507
19	17 5 25.96	2.1391	21 12 3.2	0.313	19	18 49 5.77	2.1708	19 29 6.3	4.608
20	17 7 34.34	2.1403	21 12 19.0	0.212	20	18 51 16.02	2.1710	19 24 26.8	4.709
21	17 9 42.80	2.1416	21 12 28.6	0.110	21	18 53 26.29	2.1711	19 19 41.2	4.810
22	17 11 51.33	2.1427	21 12 32.2	−0.010	22	18 55 36.55	2.1711	19 14 49.6	4.911
23	17 13 59.92	2.1438	−21 12 29.8	+0.092	23	18 57 46.82	2.1712	−19 9 51.9	+5.012
SEPTEMBER 3.					SEPTEMBER 5.				
0	17 16 8.59	2.1451	−21 12 21.2	+0.193	0	18 59 57.09	2.1712	−19 4 48.2	+5.112
1	17 18 17.33	2.1462	21 12 6.6	0.295	1	19 2 7.36	2.1712	18 59 38.5	5.213
2	17 20 26.13	2.1472	21 11 45.8	0.398	2	19 4 17.63	2.1712	18 54 22.7	5.313
3	17 22 34.99	2.1483	21 11 18.9	0.499	3	19 6 27.90	2.1712	18 49 1.0	5.412
4	17 24 43.92	2.1493	21 10 45.9	0.601	4	19 8 38.17	2.1711	18 43 33.3	5.512
5	17 26 52.91	2.1504	21 10 6.8	0.703	5	19 10 48.43	2.1710	18 37 59.6	5.611
6	17 29 1.97	2.1514	21 9 21.6	0.805	6	19 12 58.69	2.1709	18 32 20.0	5.710
7	17 31 11.08	2.1523	21 8 30.2	0.908	7	19 15 8.94	2.1708	18 26 34.4	5.808
8	17 33 20.24	2.1533	21 7 32.6	1.011	8	19 17 19.19	2.1708	18 20 43.0	5.907
9	17 35 29.47	2.1542	21 6 28.9	1.113	9	19 19 29.43	2.1706	18 14 45.6	6.005
10	17 37 38.74	2.1551	21 5 19.0	1.216	10	19 21 39.66	2.1704	18 8 42.4	6.103
11	17 39 48.08	2.1560	21 4 3.0	1.318	11	19 23 49.88	2.1703	18 2 33.3	6.201
12	17 41 57.46	2.1568	21 2 40.8	1.422	12	19 26 0.10	2.1703	17 56 18.3	6.298
13	17 44 6.89	2.1577	21 1 12.4	1.524	13	19 28 10.31	2.1700	17 49 57.5	6.394
14	17 46 16.38	2.1584	20 59 37.9	1.627	14	19 30 20.50	2.1698	17 43 31.0	6.491
15	17 48 25.90	2.1592	20 57 57.2	1.731	15	19 32 30.69	2.1697	17 36 58.6	6.588
16	17 50 35.48	2.1600	20 56 10.2	1.834	16	19 34 40.86	2.1694	17 30 20.5	6.683
17	17 52 45.10	2.1607	20 54 17.1	1.937	17	19 36 51.02	2.1692	17 23 36.6	6.778
18	17 54 54.76	2.1613	20 52 17.8	2.040	18	19 39 1.16	2.1689	17 16 47.1	6.873
19	17 57 4.46	2.1620	20 50 12.3	2.143	19	19 41 11.29	2.1688	17 9 51.8	6.968
20	17 59 14.20	2.1627	20 48 0.6	2.247	20	19 43 21.41	2.1685	17 2 50.9	7.063
21	18 1 23.98	2.1633	20 45 42.7	2.349	21	19 45 31.51	2.1683	16 55 44.3	7.157
22	18 3 33.80	2.1639	20 43 18.7	2.453	22	19 47 41.60	2.1680	16 48 32.1	7.250
23	18 5 43.65	2.1644	20 40 48.4	2.557	23	19 49 51.67	2.1678	16 41 14.3	7.343
24	18 7 53.53	2.1650	−20 38 11.9	+2.660	24	19 52 1.73	2.1675	−16 33 51.0	+7

MOON, 1919.

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	SEPTEMBER 6.							
	h	m	s	s	°	′	″	″
0	19	52	1.73	2.1675	−16	33	51.0	+ 7.435
1	19	54	11.77	2.1673	16	26	22.1	7.528
2	19	56	21.80	2.1669	16	18	47.7	7.619
3	19	58	31.80	2.1666	16	11	7.8	7.710
4	20	0	41.79	2.1664	16	3	22.5	7.801
5	20	2	51.77	2.1662	15	55	31.7	7.891
6	20	5	1.73	2.1658	15	47	35.6	7.981
7	20	7	11.66	2.1654	15	39	34.0	8.070
8	20	9	21.58	2.1652	15	31	27.2	8.158
9	20	11	31.49	2.1649	15	23	15.0	8.248
10	20	13	41.37	2.1646	15	14	57.5	8.335
11	20	15	51.24	2.1643	15	6	34.8	8.422
12	20	18	1.09	2.1641	14	58	6.9	8.508
13	20	20	10.93	2.1638	14	49	33.8	8.594
14	20	22	20.75	2.1635	14	40	55.6	8.680
15	20	24	30.55	2.1632	14	32	12.2	8.765
16	20	26	40.33	2.1629	14	23	23.8	8.849
17	20	28	50.10	2.1628	14	14	30.3	8.933
18	20	30	59.86	2.1625	14	5	31.9	9.016
19	20	33	9.60	2.1622	13	56	28.4	9.098
20	20	35	19.32	2.1619	13	47	20.1	9.180
21	20	37	29.03	2.1617	13	38	6.8	9.261
22	20	39	38.72	2.1614	13	28	48.8	9.341
23	20	41	48.40	2.1613	−13	19	25.9	+ 9.422
	SEPTEMBER 7.							
0	20	43	58.07	2.1611	−13	9	58.2	+ 9.501
1	20	46	7.73	2.1609	13	0	25.8	9.579
2	20	48	17.38	2.1608	12	50	48.7	9.657
3	20	50	27.02	2.1605	12	41	7.0	9.733
4	20	52	36.64	2.1603	12	31	20.7	9.810
5	20	54	46.26	2.1603	12	21	29.8	9.886
6	20	56	55.87	2.1601	12	11	34.4	9.961
7	20	59	5.47	2.1599	12	1	34.5	10.035
8	21	1	15.06	2.1598	11	51	30.2	10.108
9	21	3	24.65	2.1598	11	41	21.5	10.181
10	21	5	34.23	2.1597	11	31	8.5	10.253
11	21	7	43.81	2.1596	11	20	51.2	10.323
12	21	9	53.38	2.1595	11	10	29.7	10.393
13	21	12	2.95	2.1596	11	0	4.0	10.463
14	21	14	12.53	2.1596	10	49	34.1	10.533
15	21	16	22.10	2.1595	10	39	0.1	10.600
16	21	18	31.67	2.1596	10	28	22.1	10.667
17	21	20	41.25	2.1597	10	17	40.1	10.733
18	21	22	50.83	2.1597	10	6	54.1	10.798
19	21	25	0.41	2.1598	9	56	4.3	10.863
20	21	27	10.00	2.1599	9	45	10.6	10.927
21	21	29	19.60	2.1601	9	34	13.1	10.989
22	21	31	29.21	2.1603	9	23	11.9	11.052
23	21	33	38.83	2.1604	9	12	6.9	11.113
24	21	35	48.46	2.1606	−9	0	58.4	+11.172

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
	SEPTEMBER 8.							
	h	m	s	s	°	′	″	″
0	21	35	48.46	2.1606	−9	0	58.4	+11.172
1	21	37	58.10	2.1608	8	49	46.3	11.231
2	21	40	7.76	2.1612	8	38	30.7	11.289
3	21	42	17.44	2.1614	8	27	11.6	11.347
4	21	44	27.13	2.1617	8	15	49.1	11.403
5	21	46	36.84	2.1621	8	4	23.2	11.458
6	21	48	46.58	2.1625	7	52	54.1	11.513
7	21	50	56.34	2.1628	7	41	21.7	11.566
8	21	53	6.12	2.1633	7	29	46.2	11.618
9	21	55	15.93	2.1638	7	18	7.5	11.670
10	21	57	25.77	2.1642	7	6	25.8	11.720
11	21	59	35.63	2.1647	6	54	41.1	11.769
12	22	1	45.53	2.1653	6	42	53.5	11.818
13	22	3	55.46	2.1658	6	31	3.0	11.865
14	22	6	5.43	2.1664	6	19	9.7	11.911
15	22	8	15.43	2.1670	6	7	13.7	11.956
16	22	10	25.47	2.1678	5	55	15.0	12.000
17	22	12	35.56	2.1684	5	43	13.7	12.043
18	22	14	45.68	2.1691	5	31	9.8	12.085
19	22	16	55.85	2.1699	5	19	3.5	12.126
20	22	19	6.07	2.1708	5	6	54.7	12.166
21	22	21	16.34	2.1715	4	54	43.6	12.205
22	22	23	26.65	2.1723	4	42	30.1	12.243
23	22	25	37.02	2.1733	−4	30	14.5	+12.278
	SEPTEMBER 9.							
0	22	27	47.45	2.1743	−4	17	56.7	+12.313
1	22	29	57.93	2.1753	4	5	36.9	12.348
2	22	32	8.48	2.1763	3	53	15.0	12.381
3	22	34	19.08	2.1773	3	40	51.2	12.413
4	22	36	29.75	2.1783	3	28	25.5	12.443
5	22	38	40.48	2.1794	3	15	58.0	12.473
6	22	40	51.28	2.1806	3	3	28.8	12.501
7	22	43	2.15	2.1818	2	50	57.9	12.528
8	22	45	13.09	2.1830	2	38	25.5	12.553
9	22	47	24.11	2.1843	2	25	51.5	12.578
10	22	49	35.20	2.1855	2	13	16.1	12.602
11	22	51	46.37	2.1868	2	0	39.3	12.624
12	22	53	57.62	2.1882	1	48	1.2	12.645
13	22	56	8.95	2.1896	1	35	21.9	12.664
14	22	58	20.37	2.1911	1	22	41.5	12.683
15	23	0	31.88	2.1926	1	9	59.9	12.701
16	23	2	43.48	2.1941	0	57	17.4	12.716
17	23	4	55.17	2.1956	0	44	34.0	12.730
18	23	7	6.95	2.1972	0	31	49.8	12.744
19	23	9	18.83	2.1988	0	19	4.7	12.757
20	23	11	30.81	2.2005	−0	6	19.0	12.767
21	23	13	42.89	2.2023	+0	6	27.3	12.776
22	23	15	55.08	2.2040	0	19	14.1	12.784
23	23	18	7.37	2.2058	0	32	1.4	12.792
24	23	20	19.77	2.2076	+0	44	49.1	+12.797

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 10.					SEPTEMBER 12.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 20 19.77	2.2076	+ 0 44 49.1	+12.797	0	1 9 4.49	2.3353	+10 38 59.1	+11.412
1	23 22 32.28	2.2094	0 57 37.0	12.801	1	1 11 24.71	2.3387	10 50 21.9	11.348
2	23 24 44.90	2.2113	1 10 25.2	12.803	2	1 13 45.13	2.3419	11 1 40.8	11.281
3	23 26 57.64	2.2133	1 23 13.4	12.805	3	1 16 5.74	2.3452	11 12 55.6	11.214
4	23 29 10.50	2.2153	1 36 1.8	12.806	4	1 18 26.56	2.3486	11 24 6.5	11.147
5	23 31 23.47	2.2173	1 48 50.1	12.803	5	1 20 47.58	2.3519	11 35 13.2	11.076
6	23 33 36.57	2.2193	2 1 38.2	12.801	6	1 23 8.79	2.3553	11 46 15.6	11.005
7	23 35 49.79	2.2214	2 14 26.2	12.798	7	1 25 30.21	2.3587	11 57 13.8	10.933
8	23 38 3.14	2.2236	2 27 13.9	12.792	8	1 27 51.83	2.3620	12 8 7.5	10.858
9	23 40 16.62	2.2258	2 40 1.2	12.785	9	1 30 13.65	2.3653	12 18 56.8	10.783
10	23 42 30.23	2.2279	2 52 48.1	12.778	10	1 32 35.67	2.3687	12 29 41.5	10.707
11	23 44 43.97	2.2302	3 5 34.5	12.768	11	1 34 57.89	2.3721	12 40 21.6	10.628
12	23 46 57.85	2.2324	3 18 20.3	12.758	12	1 37 20.32	2.3755	12 50 56.9	10.548
13	23 49 11.86	2.2347	3 31 5.4	12.745	13	1 39 42.95	2.3788	13 1 27.4	10.468
14	23 51 26.02	2.2372	3 43 49.7	12.731	14	1 42 5.78	2.3823	13 11 53.0	10.385
15	23 53 40.32	2.2395	3 56 33.1	12.716	15	1 44 28.82	2.3856	13 22 13.6	10.302
16	23 55 54.76	2.2418	4 9 15.6	12.699	16	1 46 52.05	2.3889	13 32 29.2	10.218
17	23 58 9.34	2.2443	4 21 57.0	12.681	17	1 49 15.49	2.3923	13 42 39.7	10.131
18	0 0 24.08	2.2469	4 34 37.3	12.662	18	1 51 39.13	2.3956	13 52 44.9	10.043
19	0 2 38.97	2.2493	4 47 16.4	12.642	19	1 54 2.96	2.3989	14 2 44.8	9.953
20	0 4 54.00	2.2519	4 59 54.3	12.619	20	1 56 27.00	2.4023	14 12 39.3	9.863
21	0 7 9.20	2.2546	5 12 30.7	12.595	21	1 58 51.24	2.4057	14 22 28.4	9.773
22	0 9 24.55	2.2572	5 25 5.7	12.571	22	2 1 15.68	2.4090	14 32 12.0	9.679
23	0 11 40.06	2.2598	+ 5 37 39.2	+12.544	23	2 3 40.32	2.4123	+14 41 49.9	+ 9.585
	SEPTEMBER 11.					SEPTEMBER 13.			
0	0 13 55.73	2.2625	+ 5 50 11.0	+12.516	0	2 6 5.15	2.4155	+14 51 22.2	+ 9.490
1	0 16 11.56	2.2652	6 2 41.1	12.487	1	2 8 30.18	2.4188	15 0 48.7	9.393
2	0 18 27.55	2.2680	6 15 9.4	12.456	2	2 10 55.41	2.4221	15 10 9.4	9.296
3	0 20 43.72	2.2708	6 27 35.8	12.423	3	2 13 20.83	2.4253	15 19 24.2	9.197
4	0 23 0.05	2.2736	6 40 0.2	12.390	4	2 15 46.44	2.4285	15 28 33.0	9.096
5	0 25 16.55	2.2764	6 52 22.6	12.355	5	2 18 12.25	2.4318	15 37 35.7	8.995
6	0 27 33.22	2.2793	7 4 42.8	12.318	6	2 20 38.25	2.4348	15 46 32.4	8.893
7	0 29 50.06	2.2822	7 17 0.8	12.280	7	2 23 4.43	2.4379	15 55 22.8	8.788
8	0 32 7.08	2.2852	7 29 16.4	12.241	8	2 25 30.80	2.4411	16 4 6.9	8.683
9	0 34 24.28	2.2882	7 41 29.7	12.200	9	2 27 57.36	2.4442	16 12 44.7	8.578
10	0 36 41.66	2.2912	7 53 40.4	12.157	10	2 30 24.10	2.4472	16 21 16.2	8.470
11	0 38 59.22	2.2942	8 5 48.5	12.113	11	2 32 51.02	2.4502	16 29 41.1	8.361
12	0 41 16.96	2.2972	8 17 54.0	12.068	12	2 35 18.12	2.4532	16 37 59.5	8.252
13	0 43 34.88	2.3003	8 29 56.7	12.021	13	2 37 45.40	2.4562	16 46 11.3	8.141
14	0 45 52.99	2.3033	8 41 56.5	11.973	14	2 40 12.86	2.4591	16 54 16.4	8.028
15	0 48 11.28	2.3064	8 53 53.4	11.923	15	2 42 40.49	2.4619	17 2 14.7	7.916
16	0 50 29.76	2.3096	9 5 47.3	11.873	16	2 45 8.29	2.4648	17 10 6.3	7.803
17	0 52 48.43	2.3128	9 17 38.1	11.820	17	2 47 36.26	2.4676	17 17 51.0	7.688
18	0 55 7.29	2.3159	9 29 25.7	11.765	18	2 50 4.40	2.4703	17 25 28.8	7.572
19	0 57 26.34	2.3191	9 41 9.9	11.709	19	2 52 32.70	2.4730	17 32 59.6	7.454
20	0 59 45.58	2.3223	9 52 50.8	11.653	20	2 55 1.16	2.4757	17 40 23.3	7.336
21	1 2 5.02	2.3255	10 4 28.3	11.595	21	2 57 29.78	2.4783	17 47 39.9	7.218
22	1 4 24.64	2.3288	10 16 2.2	11.535	22	2 59 58.55	2.4808	17 54 49.4	7.098
23	1 6 44.47	2.3321	10 27 32.5	11.474	23	3 2 27.48	2.4834	18 1 51.6	6.977
24	1 9 4.49	2.3353	+10 38 59.1	+11.412	24	3 4 56.56	2.4858	+18 8 46.6	+ 6.855

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 14.					SEPTEMBER 16.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 4 56.56	2.4858	+18 8 46.6	+6.855	0	5 5 50.30	2.5215	+21 5 14.6	+0.353
1	3 7 25.78	2.4883	18 15 34.2	6.733	1	5 8 21.55	2.5203	21 5 31.6	0.214
2	3 9 55.15	2.4907	18 22 14.5	6.609	2	5 10 52.73	2.5189	21 5 40.3	+0.075
3	3 12 24.66	2.4929	18 28 47.3	6.484	3	5 13 23.82	2.5174	21 5 40.6	−0.065
4	3 14 54.30	2.4952	18 35 12.6	6.359	4	5 15 54.82	2.5159	21 5 32.5	0.204
5	3 17 24.08	2.4974	18 41 30.4	6.233	5	5 18 25.73	2.5143	21 5 16.1	0.343
6	3 19 53.99	2.4995	18 47 40.6	6.107	6	5 20 56.54	2.5127	21 4 51.4	0.482
7	3 22 24.02	2.5015	18 53 43.2	5.979	7	5 23 27.25	2.5109	21 4 18.3	0.620
8	3 24 54.17	2.5036	18 59 38.1	5.851	8	5 25 57.85	2.5090	21 3 37.0	0.758
9	3 27 24.45	2.5056	19 5 25.3	5.722	9	5 28 28.33	2.5071	21 2 47.4	0.895
10	3 29 54.84	2.5073	19 11 4.7	5.592	10	5 30 58.70	2.5051	21 1 49.6	1.033
11	3 32 25.33	2.5092	19 16 36.3	5.462	11	5 33 28.94	2.5029	21 0 43.5	1.169
12	3 34 55.94	2.5110	19 22 0.1	5.331	12	5 35 59.05	2.5008	20 59 29.3	1.305
13	3 37 26.65	2.5127	19 27 16.0	5.198	13	5 38 29.03	2.4986	20 58 6.9	1.442
14	3 39 57.46	2.5143	19 32 23.9	5.066	14	5 40 58.88	2.4963	20 56 36.3	1.577
15	3 42 28.36	2.5158	19 37 23.9	4.933	15	5 43 28.58	2.4938	20 54 57.7	1.712
16	3 44 59.35	2.5173	19 42 15.9	4.800	16	5 45 58.13	2.4913	20 53 10.9	1.847
17	3 47 30.43	2.5187	19 46 59.9	4.666	17	5 48 27.54	2.4888	20 51 16.1	1.980
18	3 50 1.59	2.5199	19 51 35.8	4.531	18	5 50 56.79	2.4862	20 49 13.3	2.113
19	3 52 32.82	2.5212	19 56 3.6	4.396	19	5 53 25.88	2.4834	20 47 2.5	2.246
20	3 55 4.13	2.5224	20 0 23.3	4.260	20	5 55 54.80	2.4807	20 44 43.8	2.378
21	3 57 35.51	2.5234	20 4 34.8	4.123	21	5 58 23.56	2.4779	20 42 17.1	2.510
22	4 0 6.94	2.5244	20 8 38.1	3.987	22	6 0 52.15	2.4750	20 39 42.6	2.641
23	4 2 38.44	2.5254	+20 12 33.2	+3.850	23	6 3 20.56	2.4720	+20 37 0.2	−2.772
	SEPTEMBER 15.					SEPTEMBER 17.			
0	4 5 9.99	2.5263	+20 16 20.1	+3.713	0	6 5 48.79	2.4690	+20 34 10.0	−2.901
1	4 7 41.59	2.5270	20 19 58.7	3.575	1	6 8 16.84	2.4658	20 31 12.1	3.030
2	4 10 13.23	2.5277	20 23 29.1	3.437	2	6 10 44.69	2.4627	20 28 6.4	3.159
3	4 12 44.91	2.5283	20 26 51.1	3.298	3	6 13 12.36	2.4595	20 24 53.0	3.287
4	4 15 16.63	2.5288	20 30 4.8	3.159	4	6 15 39.83	2.4562	20 21 32.0	3.413
5	4 17 48.37	2.5293	20 33 10.2	3.020	5	6 18 7.10	2.4528	20 18 3.4	3.540
6	4 20 20.14	2.5297	20 36 7.2	2.881	6	6 20 34.17	2.4494	20 14 27.2	3.665
7	4 22 51.93	2.5300	20 38 55.9	2.742	7	6 23 1.03	2.4459	20 10 43.6	3.789
8	4 25 23.74	2.5302	20 41 36.2	2.601	8	6 25 27.68	2.4424	20 6 52.5	3.914
9	4 27 55.55	2.5303	20 44 8.0	2.461	9	6 27 54.12	2.4389	20 2 53.9	4.038
10	4 30 27.37	2.5303	20 46 31.5	2.321	10	6 30 20.35	2.4353	19 58 48.0	4.159
11	4 32 59.18	2.5302	20 48 46.5	2.180	11	6 32 46.36	2.4316	19 54 34.8	4.281
12	4 35 30.99	2.5301	20 50 53.1	2.040	12	6 35 12.14	2.4278	19 50 14.3	4.402
13	4 38 2.79	2.5298	20 52 51.3	1.899	13	6 37 37.70	2.4241	19 45 46.6	4.522
14	4 40 34.57	2.5294	20 54 41.0	1.759	14	6 40 3.03	2.4203	19 41 11.7	4.641
15	4 43 6.32	2.5290	20 56 22.4	1.619	15	6 42 28.13	2.4164	19 36 29.7	4.759
16	4 45 38.05	2.5286	20 57 55.3	1.478	16	6 44 53.00	2.4126	19 31 40.6	4.877
17	4 48 9.75	2.5280	20 59 19.7	1.337	17	6 47 17.64	2.4086	19 26 44.5	4.993
18	4 50 41.41	2.5273	21 0 35.7	1.197	18	6 49 42.03	2.4046	19 21 41.5	5.108
19	4 53 13.03	2.5266	21 1 43.3	1.056	19	6 52 6.19	2.4006	19 16 31.6	5.223
20	4 55 44.60	2.5258	21 2 42.4	0.915	20	6 54 30.10	2.3964	19 11 14.8	5.337
21	4 58 16.12	2.5248	21 3 33.1	0.774	21	6 56 53.76	2.3923	19 5 51.2	5.450
22	5 0 47.58	2.5238	21 4 15.3	0.634	22	6 59 17.18	2.3883	19 0 20.8	5.562
23	5 3 18.97	2.5227	21 4 49.2	0.494	23	7 1 40.35	2.3841	18 54 43.8	5.672
24	5 5 50.30	2.5215	+21 5 14.6	+0.353	24	7 4 3.27	2.3798	+18 49 0.2	−5.782

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 18.					SEPTEMBER 20.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 4 3.27	2.3798	+18 49 0.2	−5.782	0	8 53 11.95	2.1689	+12 24 33.5	− 9.823
1	7 6 25.93	2.3756	18 43 10.0	5.890	1	8 55 21.96	2.1648	12 14 42.4	9.880
2	7 8 48.34	2.3714	18 37 13.4	5.998	2	8 57 31.73	2.1608	12 4 47.9	9.936
3	7 11 10.50	2.3671	18 31 10.2	6.106	3	8 59 41.25	2.1567	11 54 50.1	9.991
4	7 13 32.39	2.3628	18 25 0.7	6.211	4	9 1 50.53	2.1528	11 44 49.0	10.046
5	7 15 54.03	2.3584	18 18 44.9	6.316	5	9 3 59.58	2.1488	11 34 44.6	10.099
6	7 18 15.40	2.3541	18 12 22.8	6.421	6	9 6 8.38	2.1448	11 24 37.1	10.151
7	7 20 36.52	2.3498	18 5 54.4	6.523	7	9 8 16.95	2.1408	11 14 26.5	10.202
8	7 22 57.37	2.3453	17 59 20.0	6.625	8	9 10 25.28	2.1370	11 4 12.9	10.252
9	7 25 17.96	2.3409	17 52 39.4	6.727	9	9 12 33.39	2.1332	10 53 56.3	10.301
10	7 27 38.28	2.3365	17 45 52.8	6.826	10	9 14 41.26	2.1293	10 43 36.8	10.349
11	7 29 58.34	2.3321	17 39 0.3	6.925	11	9 16 48.90	2.1255	10 33 14.4	10.396
12	7 32 18.13	2.3276	17 32 1.8	7.023	12	9 18 56.32	2.1218	10 22 49.3	10.441
13	7 34 37.65	2.3231	17 24 57.5	7.119	13	9 21 3.52	2.1181	10 12 21.5	10.486
14	7 36 56.90	2.3187	17 17 47.5	7.215	14	9 23 10.49	2.1144	10 1 51.0	10.530
15	7 39 15.89	2.3142	17 10 31.7	7.310	15	9 25 17.25	2.1108	9 51 17.9	10.572
16	7 41 34.60	2.3097	17 3 10.3	7.403	16	9 27 23.78	2.1072	9 40 42.4	10.613
17	7 43 53.05	2.3052	16 55 43.3	7.496	17	9 29 30.11	2.1037	9 30 4.3	10.654
18	7 46 11.22	2.3007	16 48 10.8	7.587	18	9 31 36.22	2.1001	9 19 23.9	10.693
19	7 48 29.13	2.2962	16 40 32.9	7.678	19	9 33 42.12	2.0966	9 8 41.1	10.732
20	7 50 46.76	2.2916	16 32 49.5	7.768	20	9 35 47.81	2.0932	8 57 56.1	10.769
21	7 53 4.12	2.2871	16 25 0.8	7.856	21	9 37 53.30	2.0898	8 47 8.8	10.806
22	7 55 21.21	2.2826	16 17 6.8	7.943	22	9 39 58.59	2.0864	8 36 19.4	10.841
23	7 57 38.03	2.2781	+16 9 7.7	−8.028	23	9 42 3.67	2.0830	+ 8 25 27.9	−10.875
	SEPTEMBER 19.					SEPTEMBER 21.			
0	7 59 54.58	2.2736	+16 1 3.4	−8.113	0	9 44 8.55	2.0798	+ 8 14 34.4	−10.908
1	8 2 10.86	2.2690	15 52 54.1	8.198	1	9 46 13.24	2.0765	8 3 38.9	10.940
2	8 4 26.86	2.2645	15 44 39.7	8.280	2	9 48 17.73	2.0733	7 52 41.6	10.971
3	8 6 42.60	2.2600	15 36 20.5	8.362	3	9 50 22.03	2.0701	7 41 42.4	11.002
4	8 8 58.06	2.2555	15 27 56.3	8.443	4	9 52 26.14	2.0670	7 30 41.4	11.031
5	8 11 13.26	2.2511	15 19 27.4	8.522	5	9 54 30.07	2.0639	7 19 38.7	11.058
6	8 13 28.19	2.2466	15 10 53.7	8.600	6	9 56 33.81	2.0608	7 8 34.4	11.086
7	8 15 42.85	2.2421	15 2 15.4	8.677	7	9 58 37.37	2.0579	6 57 28.4	11.112
8	8 17 57.24	2.2377	14 53 32.5	8.753	8	10 0 40.76	2.0549	6 46 21.0	11.137
9	8 20 11.37	2.2333	14 44 45.0	8.829	9	10 2 43.96	2.0520	6 35 12.0	11.162
10	8 22 25.23	2.2288	14 35 53.0	8.903	10	10 4 47.00	2.0492	6 24 1.6	11.184
11	8 24 38.82	2.2243	14 26 56.7	8.975	11	10 6 49.86	2.0463	6 12 49.9	11.207
12	8 26 52.15	2.2200	14 17 56.0	9.048	12	10 8 52.55	2.0435	6 1 36.8	11.228
13	8 29 5.22	2.2156	14 8 51.0	9.118	13	10 10 55.08	2.0408	5 50 22.5	11.248
14	8 31 18.02	2.2113	13 59 41.9	9.187	14	10 12 57.44	2.0380	5 39 7.0	11.268
15	8 33 30.57	2.2070	13 50 28.6	9.256	15	10 14 59.64	2.0354	5 27 50.4	11.286
16	8 35 42.86	2.2026	13 41 11.2	9.323	16	10 17 1.69	2.0328	5 16 32.7	11.303
17	8 37 54.88	2.1983	13 31 49.9	9.388	17	10 19 3.58	2.0303	5 5 14.1	11.319
18	8 40 6.65	2.1941	13 22 24.6	9.454	18	10 21 5.32	2.0277	4 53 54.4	11.335
19	8 42 18.17	2.1898	13 12 55.4	9.518	19	10 23 6.90	2.0252	4 42 33.9	11.349
20	8 44 29.43	2.1855	13 3 22.4	9.582	20	10 25 8.34	2.0228	4 31 12.5	11.363
21	8 46 40.43	2:1813	12 53 45.6	9.643	21	10 27 9.64	2.0205	4 19 50.4	11.375
22	8 48 51.19	2.1772	12 44 5.2	9.704	22	10 29 10.80	2.0181	4 8 27.5	11.388
23	8 51 1.69	2.1730	12 34 21.1	9.764	23	10 31 11.81	2.0158	3 57 3.9	11.398
24	8 53 11.95	2.1689	+12 24 33.5	−9.823	24	10 33 12.69	2.0136	+ 3 45 39.8	−11.4[illegible]

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 22.			
	h m s	s	° ′ ″	″
0	10 33 12.69	2.0136	+3 45 39.8	−11.407
1	10 35 13.44	2.0113	3 34 15.1	11.416
2	10 37 14.05	2.0091	3 22 49.9	11.424
3	10 39 14.53	2.0070	3 11 24.2	11.432
4	10 41 14.89	2.0050	2 59 58.1	11.438
5	10 43 15.13	2.0030	2 48 31.7	11.443
6	10 45 15.25	2.0009	2 37 5.0	11.447
7	10 47 15.24	1.9989	2 25 38.1	11.451
8	10 49 15.12	1.9972	2 14 10.9	11.453
9	10 51 14.90	1.9953	2 2 43.7	11.454
10	10 53 14.56	1.9934	1 51 16.4	11.455
11	10 55 14.11	1.9917	1 39 49.1	11.454
12	10 57 13.56	1.9900	1 28 21.9	11.453
13	10 59 12.91	1.9883	1 16 54.7	11.452
14	11 1 12.16	1.9867	1 5 27.7	11.448
15	11 3 11.31	1.9851	0 54 0.9	11.445
16	11 5 10.37	1.9836	0 42 34.3	11.441
17	11 7 9.34	1.9821	0 31 8.0	11.435
18	11 9 8.22	1.9807	0 19 42.1	11.428
19	11 11 7.02	1.9793	+0 8 16.6	11.422
20	11 13 5.73	1.9778	−0 3 8.5	11.414
21	11 15 4.36	1.9765	0 14 33.1	11.405
22	11 17 2.91	1.9753	0 25 57.1	11.395
23	11 19 1.39	1.9740	−0 37 20.5	−11.384
	SEPTEMBER 23.			
0	11 20 59.79	1.9728	−0 48 43.2	−11.373
1	11 22 58.12	1.9717	1 0 5.2	11.361
2	11 24 56.39	1.9706	1 11 26.5	11.348
3	11 26 54.59	1.9695	1 22 46.9	11.333
4	11 28 52.73	1.9685	1 34 6.5	11.319
5	11 30 50.81	1.9675	1 45 25.2	11.303
6	11 32 48.83	1.9666	1 56 42.9	11.287
7	11 34 46.80	1.9657	2 7 59.6	11.270
8	11 36 44.71	1.9648	2 19 15.3	11.252
9	11 38 42.58	1.9641	2 30 29.8	11.233
10	11 40 40.40	1.9633	2 41 43.2	11.213
11	11 42 38.17	1.9625	2 52 55.4	11.193
12	11 44 35.90	1.9618	3 4 6.4	11.173
13	11 46 33.59	1.9613	3 15 16.1	11.150
14	11 48 31.25	1.9607	3 26 24.4	11.128
15	11 50 28.87	1.9600	3 37 31.4	11.104
16	11 52 26.45	1.9595	3 48 36.9	11.080
17	11 54 24.01	1.9591	3 59 41.0	11.055
18	11 56 21.54	1.9586	4 10 43.5	11.028
19	11 58 19.04	1.9583	4 21 44.4	11.002
20	12 0 16.53	1.9579	4 32 43.7	10.975
21	12 2 13.99	1.9575	4 43 41.4	10.947
22	12 4 11.43	1.9573	4 54 37.3	10.918
23	12 6 8.86	1.9570	5 5 31.5	10.888
	12 8 6.27	1.9568	−5 16 23.9	−10.858

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 24.			
	h m s	s	° ′ ″	″
0	12 8 6.27	1.9568	− 5 16 23.9	−10.858
1	12 10 3.67	1.9566	5 27 14.4	10.827
2	12 12 1.06	1.9565	5 38 3.1	10.795
3	12 13 58.45	1.9564	5 48 49.8	10.763
4	12 15 55.83	1.9563	5 59 34.6	10.729
5	12 17 53.21	1.9563	6 10 17.3	10.695
6	12 19 50.58	1.9563	6 20 58.0	10.661
7	12 21 47.96	1.9564	6 31 36.6	10.625
8	12 23 45.35	1.9565	6 42 13.0	10.588
9	12 25 42.74	1.9565	6 52 47.2	10.551
10	12 27 40.13	1.9567	7 3 19.1	10.513
11	12 29 37.54	1.9569	7 13 48.8	10.476
12	12 31 34.96	1.9572	7 24 16.2	10.437
13	12 33 32.40	1.9574	7 34 41.2	10.398
14	12 35 29.85	1.9577	7 45 3.9	10.357
15	12 37 27.32	1.9580	7 55 24.0	10.315
16	12 39 24.81	1.9583	8 5 41.7	10.274
17	12 41 22.32	1.9588	8 15 56.9	10.232
18	12 43 19.86	1.9592	8 26 9.5	10.188
19	12 45 17.42	1.9596	8 36 19.4	10.143
20	12 47 15.01	1.9602	8 46 26.7	10.099
21	12 49 12.64	1.9607	8 56 31.3	10.054
22	12 51 10.29	1.9612	9 6 33.2	10.008
23	12 53 7.98	1.9618	− 9 16 32.3	− 9.962
	SEPTEMBER 25.			
0	12 55 5.70	1.9623	− 9 26 28.6	− 9.914
1	12 57 3.46	1.9630	9 36 22.0	9.867
2	12 59 1.26	1.9637	9 46 12.6	9.818
3	13 0 59.10	1.9644	9 56 0.2	9.768
4	13 2 56.99	1.9652	10 5 44.8	9.719
5	13 4 54.92	1.9658	10 15 26.5	9.669
6	13 6 52.89	1.9666	10 25 5.1	9.618
7	13 8 50.91	1.9674	10 34 40.6	9.566
8	13 10 48.98	1.9683	10 44 13.0	9.513
9	13 12 47.11	1.9692	10 53 42.2	9.460
10	13 14 45.28	1.9700	11 3 8.2	9.407
11	13 16 43.51	1.9709	11 12 31.0	9.353
12	13 18 41.79	1.9718	11 21 50.5	9.298
13	13 20 40.13	1.9728	11 31 6.7	9.243
14	13 22 38.53	1.9738	11 40 19.6	9.187
15	13 24 36.98	1.9748	11 49 29.1	9.129
16	13 26 35.50	1.9758	11 58 35.1	9.072
17	13 28 34.08	1.9769	12 7 37.7	9.014
18	13 30 32.73	1.9780	12 16 36.8	8.956
19	13 32 31.44	1.9790	12 25 32.4	8.897
20	13 34 30.21	1.9802	12 34 24.4	8.838
21	13 36 29.06	1.9813	12 43 12.9	8.778
22	13 38 27.97	1.9825	12 51 57.7	8.716
23	13 40 26.96	1.9837	13 0 38.8	8.654
24	13 42 26.01	1.9848	−13 9 16.2	− 8.593

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 26.			
	h m s	s	° ′ ″	″
0	13 42 26.01	1.9848	−13 9 16.2	−8.593
1	13 44 25.14	1.9861	13 17 49.9	8.530
2	13 46 24.34	1.9873	13 26 19.8	8.467
3	13 48 23.61	1.9885	13 34 45.9	8.403
4	13 50 22.96	1.9898	13 43 8.2	8.338
5	13 52 22.39	1.9911	13 51 26.5	8.273
6	13 54 21.89	1.9924	13 59 41.0	8.208
7	13 56 21.48	1.9938	14 7 51.5	8.142
8	13 58 21.14	1.9951	14 15 58.0	8.076
9	14 0 20.89	1.9964	14 24 0.6	8.009
10	14 2 20.71	1.9978	14 31 59.1	7.942
11	14 4 20.62	1.9993	14 39 53.6	7.873
12	14 6 20.62	2.0007	14 47 43.9	7.804
13	14 8 20.70	2.0020	14 55 30.1	7.736
14	14 10 20.86	2.0033	15 3 12.2	7.666
15	14 12 21.10	2.0048	15 10 50.0	7.595
16	14 14 21.44	2.0063	15 18 23.6	7.525
17	14 16 21.86	2.0078	15 25 53.0	7.453
18	14 18 22.37	2.0092	15 33 18.0	7.382
19	14 20 22.96	2.0106	15 40 38.8	7.310
20	14 22 23.64	2.0121	15 47 55.2	7.237
21	14 24 24.41	2.0137	15 55 7.2	7.163
22	14 26 25.28	2.0152	16 2 14.8	7.090
23	14 28 26.23	2.0166	−16 9 18.0	−7.016
	SEPTEMBER 27.			
0	14 30 27.27	2.0181	−16 16 16.7	−6.941
1	14 32 28.40	2.0197	16 23 10.9	6.866
2	14 34 29.63	2.0213	16 30 0.6	6.790
3	14 36 30.95	2.0227	16 36 45.7	6.713
4	14 38 32.35	2.0243	16 43 26.2	6.637
5	14 40 33.86	2.0258	16 50 2.1	6.560
6	14 42 35.45	2.0273	16 56 33.4	6.483
7	14 44 37.13	2.0288	17 3 0.0	6.405
8	14 46 38.91	2.0304	17 9 22.0	6.327
9	14 48 40.78	2.0320	17 15 39.2	6.247
10	14 50 42.75	2.0336	17 21 51.6	6.168
11	14 52 44.81	2.0351	17 27 59.3	6.088
12	14 54 46.96	2.0367	17 34 2.2	6.008
13	14 56 49.21	2.0383	17 40 0.3	5.928
14	14 58 51.55	2.0398	17 45 53.5	5.846
15	15 0 53.98	2.0413	17 51 41.8	5.764
16	15 2 56.51	2.0429	17 57 25.2	5.683
17	15 4 59.13	2.0444	18 3 3.7	5.600
18	15 7 1.84	2.0460	18 8 37.2	5.517
19	15 9 4.65	2.0476	18 14 5.7	5.434
20	15 11 7.55	2.0491	18 19 29.3	5.351
21	15 13 10.54	2.0506	18 24 47.8	5.267
22	15 15 13.62	2.0522	18 30 1.3	5.183
23	15 17 16.80	2.0538	18 35 9.7	5.098
24	15 19 20.07	2.0553	−18 40 13.0	−5.013

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 28.			
	h m s	s	° ′ ″	″
0	15 19 20.07	2.0553	−18 40 13.0	−5.013
1	15 21 23.43	2.0568	18 45 11.2	4.927
2	15 23 26.88	2.0583	18 50 4.2	4.841
3	15 25 30.43	2.0598	18 54 52.1	4.755
4	15 27 34.06	2.0613	18 59 34.8	4.668
5	15 29 37.79	2.0628	19 4 12.3	4.581
6	15 31 41.60	2.0643	19 8 44.5	4.493
7	15 33 45.50	2.0658	19 13 11.5	4.407
8	15 35 49.49	2.0673	19 17 33.3	4.318
9	15 37 53.57	2.0687	19 21 49.7	4.229
10	15 39 57.73	2.0701	19 26 0.8	4.141
11	15 42 1.98	2.0716	19 30 6.6	4.053
12	15 44 6.32	2.0730	19 34 7.1	3.963
13	15 46 10.74	2.0744	19 38 2.2	3.873
14	15 48 15.25	2.0758	19 41 51.9	3.783
15	15 50 19.84	2.0772	19 45 36.2	3.693
16	15 52 24.51	2.0786	19 49 15.0	3.602
17	15 54 29.27	2.0800	19 52 48.4	3.512
18	15 56 34.11	2.0813	19 56 16.4	3.420
19	15 58 39.03	2.0827	19 59 38.8	3.328
20	16 0 44.03	2.0840	20 2 55.8	3.238
21	16 2 49.11	2.0853	20 6 7.3	3.145
22	16 4 54.26	2.0866	20 9 13.2	3.053
23	16 6 59.50	2.0879	−20 12 13.6	−2.960
	SEPTEMBER 29.			
0	16 9 4.81	2.0892	−20 15 8.4	−2.867
1	16 11 10.20	2.0904	20 17 57.6	2.774
2	16 13 15.66	2.0917	20 20 41.3	2.681
3	16 15 21.20	2.0928	20 23 19.3	2.587
4	16 17 26.80	2.0940	20 25 51.7	2.493
5	16 19 32.48	2.0953	20 28 18.5	2.399
6	16 21 38.24	2.0965	20 30 39.6	2.305
7	16 23 44.06	2.0976	20 32 55.1	2.210
8	16 25 49.95	2.0987	20 35 4.8	2.115
9	16 27 55.90	2.0998	20 37 8.9	2.021
10	16 30 1.93	2.1010	20 39 7.3	1.925
11	16 32 8.02	2.1020	20 40 59.9	1.829
12	16 34 14.17	2.1031	20 42 46.8	1.734
13	16 36 20.39	2.1041	20 44 28.0	1.638
14	16 38 26.66	2.1051	20 46 3.4	1.543
15	16 40 33.00	2.1062	20 47 33.1	1.447
16	16 42 39.40	2.1072	20 48 57.0	1.350
17	16 44 45.86	2.1081	20 50 15.1	1.253
18	16 46 52.37	2.1090	20 51 27.3	1.156
19	16 48 58.94	2.1099	20 52 33.8	1.060
20	16 51 5.56	2.1108	20 53 34.5	0.963
21	16 53 12.24	2.1118	20 54 29.4	0.866
22	16 55 18.97	2.1126	20 55 18.4	0.768
23	16 57 25.75	2.1134	20 56 1.5	0.670
24	16 59 32.58	2.1143	−20 56 38.8	

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 30.				
	h m s	s	° ′ ″	″
0	16 59 32.58	2.1143	−20 56 38.8	−0.573
1	17 1 39.46	2.1150	20 57 10.3	0.476
2	17 3 46.38	2.1158	20 57 35.9	0.378
3	17 5 53.36	2.1166	20 57 55.6	0.279
4	17 8 0.37	2.1173	20 58 9.4	0.181
5	17 10 7.43	2.1180	20 58 17.3	−0.083
6	17 12 14.53	2.1187	20 58 19.4	+0.014
7	17 14 21.67	2.1194	20 58 15.6	0.113
8	17 16 28.86	2.1201	20 58 5.8	0.212
9	17 18 36.08	2.1206	20 57 50.2	0.310
10	17 20 43.33	2.1212	20 57 28.6	0.409
11	17 22 50.62	2.1218	20 57 1.1	0.508
12	17 24 57.95	2.1224	20 56 27.7	0.606
13	17 27 5.31	2.1229	20 55 48.4	0.705
14	17 29 12.70	2.1234	20 55 3.1	0.804
15	17 31 20.12	2.1240	20 54 11.9	0.903
16	17 33 27.58	2.1245	20 53 14.8	1.002
17	17 35 35.06	2.1248	20 52 11.7	1.101
18	17 37 42.56	2.1253	20 51 2.7	1.199
19	17 39 50.09	2.1258	20 49 47.8	1.298
20	17 41 57.65	2.1262	20 48 26.9	1.398
21	17 44 5.23	2.1265	20 47 0.1	1.497
22	17 46 12.83	2.1269	20 45 27.3	1.596
23	17 48 20.46	2.1273	−20 43 48.6	+1.694
OCTOBER 1.				
0	17 50 28.10	2.1275	−20 42 4.0	+1.793
1	17 52 35.76	2.1278	20 40 13.4	1.893
2	17 54 43.44	2.1282	20 38 16.9	1.991
3	17 56 51.14	2.1284	20 36 14.5	2.090
4	17 58 58.85	2.1287	20 34 6.1	2.189
5	18 1 6.58	2.1288	20 31 51.8	2.288
6	18 3 14.31	2.1290	20 29 31.6	2.387
7	18 5 22.06	2.1293	20 27 5.4	2.485
8	18 7 29.82	2.1294	20 24 33.4	2.584
9	18 9 37.59	2.1296	20 21 55.3	2.683
10	18 11 45.37	2.1298	20 19 11.4	2.781
11	18 13 53.16	2.1298	20 16 21.6	2.880
12	18 16 0.95	2.1299	20 13 25.8	2.978
13	18 18 8.75	2.1300	20 10 24.2	3.077
14	18 20 16.55	2.1300	20 7 16.6	3.175
15	18 22 24.35	2.1301	20 4 3.2	3.273
16	18 24 32.16	2.1302	20 0 43.9	3.371
17	18 26 39.97	2.1302	19 57 18.7	3.469
18	18 28 47.78	2.1302	19 53 47.6	3.567
19	18 30 55.59	2.1302	19 50 10.7	3.664
20	18 33 3.40	2.1302	19 46 27.9	3.762
21	18 35 11.21	2.1302	19 42 39.3	3.859
22	18 37 19.02	2.1302	19 38 44.8	3.957
23	18 39 26.83	2.1301	19 34 44.5	4.054
24	18 41 34.63	2.1300	−19 30 38.3	+4.151

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 2.				
	h m s	s	° ′ ″	″
0	18 41 34.63	2.1300	−19 30 38.3	+4.151
1	18 43 42.43	2.1299	19 26 26.4	4.248
2	18 45 50.22	2.1298	19 22 8.6	4.344
3	18 47 58.01	2.1298	19 17 45.1	4.440
4	18 50 5.79	2.1296	19 13 15.8	4.537
5	18 52 13.56	2.1294	19 8 40.7	4.633
6	18 54 21.32	2.1293	19 3 59.8	4.729
7	18 56 29.08	2.1293	18 59 13.2	4.824
8	18 58 36.83	2.1291	18 54 20.9	4.919
9	19 0 44.57	2.1289	18 49 22.9	5.015
10	19 2 52.30	2.1288	18 44 19.1	5.111
11	19 5 0.02	2.1286	18 39 9.6	5.205
12	19 7 7.73	2.1284	18 33 54.5	5.299
13	19 9 15.43	2.1283	18 28 33.7	5.394
14	19 11 23.12	2.1281	18 23 7.2	5.488
15	19 13 30.80	2.1278	18 17 35.1	5.582
16	19 15 38.46	2.1276	18 11 57.4	5.676
17	19 17 46.11	2.1275	18 6 14.0	5.769
18	19 19 53.76	2.1273	18 0 25.1	5.863
19	19 22 1.39	2.1270	17 54 30.5	5.955
20	19 24 9.00	2.1268	17 48 30.5	6.048
21	19 26 16.61	2.1267	17 42 24.8	6.140
22	19 28 24.20	2.1264	17 36 13.7	6.232
23	19 30 31.78	2.1263	−17 29 57.0	+6.323
OCTOBER 3.				
0	19 32 39.35	2.1261	−17 23 34.9	+6.414
1	19 34 46.91	2.1258	17 17 7.3	6.506
2	19 36 54.45	2.1257	17 10 34.2	6.597
3	19 39 1.99	2.1255	17 3 55.7	6.687
4	19 41 9.51	2.1253	16 57 11.8	6.777
5	19 43 17.02	2.1250	16 50 22.5	6.867
6	19 45 24.51	2.1248	16 43 27.8	6.956
7	19 47 32.00	2.1248	16 36 27.8	7.045
8	19 49 39.48	2.1245	16 29 22.4	7.134
9	19 51 46.94	2.1243	16 22 11.7	7.222
10	19 53 54.40	2.1242	16 14 55.8	7.309
11	19 56 1.84	2.1240	16 7 34.6	7.398
12	19 58 9.28	2.1239	16 0 8.1	7.485
13	20 0 16.71	2.1238	15 52 36.4	7.571
14	20 2 24.13	2.1236	15 44 59.6	7.658
15	20 4 31.54	2.1235	15 37 17.5	7.743
16	20 6 38.95	2.1233	15 29 30.4	7.828
17	20 8 46.34	2.1233	15 21 38.1	7.914
18	20 10 53.74	2.1233	15 13 40.7	7.999
19	20 13 1.13	2.1231	15 5 38.2	8.083
20	20 15 8.51	2.1230	14 57 30.7	8.167
21	20 17 15.89	2.1230	14 49 18.2	8.250
22	20 19 23.27	2.1230	14 41 0.7	8.333
23	20 21 30.65	2.1229	14 32 38.2	8.416
24	20 23 38.02	2.1228	−14 24 10.8	+8.49

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 4.				
	h m s	s	° ′ ″	″
0	20 23 38.02	2.1228	−14 24 10.8	+ 8.498
1	20 25 45.39	2.1229	14 15 38.5	8.579
2	20 27 52.77	2.1230	14 7 1.3	8.660
3	20 30 0.15	2.1230	13 58 19.3	8.740
4	20 32 7.53	2.1230	13 49 32.5	8.820
5	20 34 14.91	2.1231	13 40 40.9	8.900
6	20 36 22.30	2.1233	13 31 44.5	8.979
7	20 38 29.70	2.1233	13 22 43.4	9.058
8	20 40 37.10	2.1234	13 13 37.6	9.135
9	20 42 44.51	2.1236	13 4 27.2	9.212
10	20 44 51.93	2.1238	12 55 12.2	9.289
11	20 46 59.37	2.1240	12 45 52.5	9.366
12	20 49 6.81	2.1242	12 36 28.3	9.441
13	20 51 14.27	2.1244	12 26 59.6	9.516
14	20 53 21.74	2.1247	12 17 26.4	9.590
15	20 55 29.23	2.1250	12 7 48.8	9.664
16	20 57 36.74	2.1253	11 58 6.7	9.738
17	20 59 44.26	2.1256	11 48 20.3	9.810
18	21 1 51.81	2.1260	11 38 29.5	9.882
19	21 3 59.38	2.1263	11 28 34.5	9.953
20	21 6 6.97	2.1268	11 18 35.1	10.024
21	21 8 14.59	2.1272	11 8 31.6	10.094
22	21 10 22.23	2.1277	10 58 23.8	10.164
23	21 12 29.91	2.1282	−10 48 11.9	+10.233
OCTOBER 5.				
0	21 14 37.61	2.1287	−10 37 55.9	+10.301
1	21 16 45.35	2.1293	10 27 35.8	10.368
2	21 18 53.12	2.1298	10 17 11.8	10.434
3	21 21 0.93	2.1304	10 6 43.7	10.501
4	21 23 8.77	2.1310	9 56 11.7	10.566
5	21 25 16.65	2.1318	9 45 35.8	10.631
6	21 27 24.58	2.1325	9 34 56.0	10.695
7	21 29 32.55	2.1332	9 24 12.4	10.758
8	21 31 40.56	2.1339	9 13 25.1	10.820
9	21 33 48.62	2.1348	9 2 34.0	10.882
10	21 35 56.73	2.1356	8 51 39.3	10.943
11	21 38 4.89	2.1364	8 40 40.9	11.003
12	21 40 13.10	2.1373	8 29 39.0	11.061
13	21 42 21.37	2.1383	8 18 33.6	11.120
14	21 44 29.70	2.1393	8 7 24.6	11.178
15	21 46 38.08	2.1403	7 56 12.3	11.234
16	21 48 46.53	2.1413	7 44 56.5	11.291
17	21 50 55.04	2.1424	7 33 37.4	11.345
18	21 53 3.62	2.1435	7 22 15.1	11.399
19	21 55 12.26	2.1447	7 10 49.5	11.453
20	21 57 20.98	2.1459	6 59 20.7	11.506
21	21 59 29.77	2.1471	6 47 48.8	11.558
22	22 1 38.63	2.1483	6 36 13.8	11.608
23	22 3 47.57	2.1497	6 24 35.8	11.658
24	22 5 56.59	2.1510	− 6 12 54.9	+11.707

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 6.				
	h m s	s	° ′ ″	″
0	22 5 56.59	2.1510	−6 12 54.9	+11.707
1	22 8 5.69	2.1524	6 1 11.0	11.755
2	22 10 14.88	2.1538	5 49 24.3	11.802
3	22 12 24.15	2.1553	5 37 34.8	11.848
4	22 14 33.51	2.1568	5 25 42.6	11.893
5	22 16 42.96	2.1583	5 13 47.7	11.937
6	22 18 52.51	2.1599	5 1 50.2	11.980
7	22 21 2.15	2.1615	4 49 50.1	12.023
8	22 23 11.89	2.1632	4 37 47.5	12.063
9	22 25 21.73	2.1649	4 25 42.5	12.103
10	22 27 31.68	2.1667	4 13 35.1	12.143
11	22 29 41.73	2.1684	4 1 25.4	12.181
12	22 31 51.89	2.1703	3 49 13.4	12.218
13	22 34 2.16	2.1721	3 36 59.3	12.253
14	22 36 12.54	2.1740	3 24 43.0	12.288
15	22 38 23.04	2.1760	3 12 24.7	12.322
16	22 40 33.66	2.1780	3 0 4.4	12.354
17	22 42 44.40	2.1801	2 47 42.2	12.386
18	22 44 55.27	2.1822	2 35 18.1	12.416
19	22 47 6.26	2.1843	2 22 52.3	12.445
20	22 49 17.38	2.1864	2 10 24.7	12.473
21	22 51 28.63	2.1886	1 57 55.5	12.501
22	22 53 40.01	2.1908	1 45 24.6	12.527
23	22 55 51.53	2.1932	−1 32 52.3	+12.551
OCTOBER 7.				
0	22 58 3.19	2.1955	−1 20 18.5	+12.574
1	23 0 14.99	2.1979	1 7 43.4	12.596
2	23 2 26.94	2.2003	0 55 7.0	12.617
3	23 4 39.03	2.2028	0 42 29.4	12.637
4	23 6 51.28	2.2054	0 29 50.6	12.655
5	23 9 3.68	2.2079	0 17 10.8	12.672
6	23 11 16.23	2.2104	−0 4 30.0	12.688
7	23 13 28.93	2.2131	+0 8 11.8	12.703
8	23 15 41.80	2.2158	0 20 54.4	12.716
9	23 17 54.83	2.2186	0 33 37.7	12.728
10	23 20 8.03	2.2213	0 46 21.8	12.739
11	23 22 21.39	2.2241	0 59 6.4	12.748
12	23 24 34.92	2.2270	1 11 51.6	12.757
13	23 26 48.63	2.2299	1 24 37.2	12.763
14	23 29 2.51	2.2328	1 37 23.2	12.769
15	23 31 16.57	2.2358	1 50 9.5	12.773
16	23 33 30.81	2.2388	2 2 55.9	12.775
17	23 35 45.23	2.2419	2 15 42.5	12.777
18	23 37 59.84	2.2450	2 28 29.1	12.777
19	23 40 14.63	2.2481	2 41 15.7	12.775
20	23 42 29.61	2.2513	2 54 2.1	12.772
21	23 44 44.79	2.2546	3 6 48.3	12.768
22	23 47 0.16	2.2578	3 19 34.2	12.763
23	23 49 15.72	2.2611	3 32 19.8	12.755
24	23 51 31.49	2.2645	+3 45 4.8	+12.746

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 8.					OCTOBER 10.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 51 31.49	2.2645	+ 3 45 4.8	+12.746	0	1 44 37.48	2.4546	+13 17 12.3	+10.476
1	23 53 47.46	2.2678	3 57 49.3	12.735	1	1 47 4.88	2.4588	13 27 38.3	10.389
2	23 56 3.63	2.2713	4 10 33.0	12.723	2	1 49 32.53	2.4628	13 37 59.0	10.301
3	23 58 20.01	2.2748	4 23 16.1	12.711	3	1 52 0.42	2.4669	13 48 14.4	10.211
4	0 0 36.60	2.2782	4 35 58.3	12.606	4	1 54 28.56	2.4709	13 58 24.3	10.119
5	0 2 53.39	2.2817	4 48 39.6	12.679	5	1 56 56.93	2.4749	14 8 28.7	10.027
6	0 5 10.40	2.2853	5 1 19.8	12.661	6	1 59 25.55	2.4790	14 18 27.5	9.932
7	0 7 27.63	2.2889	5 13 58.9	12.643	7	2 1 54.41	2.4830	14 28 20.5	9.836
8	0 9 45.07	2.2925	5 26 36.9	12.622	8	2 4 23.51	2.4869	14 38 7.8	9.738
9	0 12 2.73	2.2962	5 39 13.5	12.598	9	2 6 52.84	2.4908	14 47 49.1	9.639
10	0 14 20.61	2.2998	5 51 48.7	12.575	10	2 9 22.41	2.4948	14 57 24.5	9.539
11	0 16 38.71	2.3036	6 4 22.5	12.550	11	2 11 52.21	2.4986	15 6 53.8	9.438
12	0 18 57.04	2.3073	6 16 54.7	12.523	12	2 14 22.24	2.5024	15 16 17.0	9.334
13	0 21 15.59	2.3112	6 29 25.2	12.494	13	2 16 52.50	2.5062	15 25 33.9	9.229
14	0 23 34.38	2.3150	6 41 54.0	12.463	14	2 19 22.98	2.5099	15 34 44.5	9.123
15	0 25 53.39	2.3188	6 54 20.8	12.432	15	2 21 53.69	2.5137	15 43 48.6	9.015
16	0 28 12.63	2.3227	7 6 45.8	12.399	16	2 24 24.62	2.5173	15 52 46.3	8.906
17	0 30 32.11	2.3266	7 19 8.7	12.363	17	2 26 55.77	2.5208	16 1 37.3	8.795
18	0 32 51.82	2.3305	7 31 29.4	12.327	18	2 29 27.12	2.5244	16 10 21.7	8.684
19	0 35 11.77	2.3344	7 43 47.9	12.289	19	2 31 58.70	2.5280	16 18 59.4	8.571
20	0 37 31.95	2.3384	7 56 4.1	12.249	20	2 34 30.48	2.5313	16 27 30.2	8.456
21	0 39 52.38	2.3425	8 8 17.8	12.208	21	2 37 2.46	2.5348	16 35 54.1	8.341
22	0 42 13.05	2.3464	8 20 29.0	12.165	22	2 39 34.65	2.5382	16 44 11.1	8.224
23	0 44 33.95	2.3504	+ 8 32 37.6	+12.121	23	2 42 7.04	2.5414	+16 52 21.0	+ 8.105
	OCTOBER 9.					OCTOBER 11.			
0	0 46 55.10	2.3545	+ 8 44 43.5	+12.074	0	2 44 39.62	2.5446	+17 0 23.7	+ 7.985
1	0 49 16.49	2.3586	8 56 46.5	12.027	1	2 47 12.39	2.5478	17 8 19.2	7.865
2	0 51 38.13	2.3628	9 8 46.7	11.978	2	2 49 45.36	2.5510	17 16 7.5	7.743
3	0 54 0.02	2.3668	9 20 43.8	11.926	3	2 52 18.51	2.5539	17 23 48.4	7.620
4	0 56 22.15	2.3709	9 32 37.8	11.873	4	2 54 51.83	2.5568	17 31 21.9	7.496
5	0 58 44.53	2.3751	9 44 28.5	11.818	5	2 57 25.33	2.5598	17 38 47.9	7.370
6	1 1 7.16	2.3793	9 56 16.0	11.763	6	2 59 59.01	2.5627	17 46 6.3	7.243
7	1 3 30.04	2.3834	10 8 0.1	11.705	7	3 2 32.85	2.5653	17 53 17.1	7.117
8	1 5 53.17	2.3876	10 19 40.6	11.646	8	3 5 6.85	2.5681	18 0 20.3	6.988
9	1 8 16.55	2.3918	10 31 17.6	11.585	9	3 7 41.02	2.5707	18 7 15.6	6.858
10	1 10 40.18	2.3960	10 42 50.8	11.523	10	3 10 15.33	2.5732	18 14 3.2	6.728
11	1 13 4.07	2.4002	10 54 20.3	11.458	11	3 12 49.80	2.5757	18 20 42.9	6.596
12	1 15 28.20	2.4043	11 5 45.8	11.392	12	3 15 24.41	2.5780	18 27 14.7	6.463
13	1 17 52.59	2.4086	11 17 7.3	11.325	13	3 17 59.16	2.5803	18 33 38.5	6.329
14	1 20 17.23	2.4128	11 28 24.8	11.256	14	3 20 34.05	2.5825	18 39 54.2	6.194
15	1 22 42.12	2.4170	11 39 38.0	11.184	15	3 23 9.06	2.5846	18 46 1.8	6.059
16	1 25 7.27	2.4212	11 50 46.9	11.112	16	3 25 44.20	2.5867	18 52 1.3	5.923
17	1 27 32.66	2.4253	12 1 51.5	11.038	17	3 28 19.46	2.5886	18 57 52.6	5.786
18	1 29 58.31	2.4296	12 12 51.5	10.963	18	3 30 54.83	2.5904	19 3 35.6	5.648
19	1 32 24.21	2.4338	12 23 47.0	10.886	19	3 33 30.31	2.5922	19 9 10.4	5.509
20	1 34 50.37	2.4380	12 34 37.8	10.808	20	3 36 5.89	2.5938	19 14 36.7	5.369
21	1 37 16.77	2.4422	12 45 23.9	10.727	21	3 38 41.57	2.5954	19 19 54.7	5.230
22	1 39 43.43	2.4463	12 56 5.0	10.644	22	3 41 17.34	2.5969	19 25 4.3	5.089
23	1 42 10.33	2.4504	13 6 41.2	10.561	23	3 43 53.20	2.5983	19 30 5.4	4.948
24	1 44 37.48	2.4546	+13 17 12.3	+10.476	24	3 46 29.13	2.5995	+19 34 58.0	+4.806

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 12.			
	h m s	s	° ′ ″	″
0	3 46 29.13	2.5995	+19 34 58.0	+4.806
1	3 49 5.14	2.6008	19 39 42.1	4.663
2	3 51 41.22	2.6018	19 44 17.5	4.519
3	3 54 17.36	2.6028	19 48 44.4	4.376
4	3 56 53.55	2.6036	19 53 2.6	4.232
5	3 59 29.79	2.6044	19 57 12.2	4.088
6	4 2 6.08	2.6051	20 1 13.1	3.942
7	4 4 42.40	2.6057	20 5 5.2	3.795
8	4 7 18.76	2.6062	20 8 48.5	3.649
9	4 9 55.14	2.6064	20 12 23.1	3.503
10	4 12 31.53	2.6067	20 15 48.9	3.357
11	4 15 7.94	2.6069	20 19 5.9	3.210
12	4 17 44.36	2.6069	20 22 14.1	3.063
13	4 20 20.77	2.6068	20 25 13.4	2.915
14	4 22 57.18	2.6067	20 28 3.9	2.768
15	4 25 33.57	2.6063	20 30 45.5	2.619
16	4 28 9.94	2.6059	20 33 18.2	2.471
17	4 30 46.28	2.6054	20 35 42.0	2.323
18	4 33 22.59	2.6048	20 37 56.9	2.175
19	4 35 58.86	2.6042	20 40 3.0	2.027
20	4 38 35.09	2.6033	20 42 0.1	1.878
21	4 41 11.26	2.6023	20 43 48.4	1.731
22	4 43 47.37	2.6013	20 45 27.8	1.583
23	4 46 23.42	2.6002	+20 46 58.3	+1.434
	OCTOBER 13.			
0	4 48 59.39	2.5989	+20 48 19.9	+1.286
1	4 51 35.29	2.5975	20 49 32.6	1.138
2	4 54 11.09	2.5960	20 50 36.5	0.991
3	4 56 46.81	2.5945	20 51 31.5	0.843
4	4 59 22.43	2.5928	20 52 17.6	0.695
5	5 1 57.95	2.5911	20 52 54.9	0.548
6	5 4 33.36	2.5891	20 53 23.4	0.402
7	5 7 8.64	2.5871	20 53 43.1	0.255
8	5 9 43.81	2.5851	20 53 54.0	+0.109
9	5 12 18.85	2.5828	20 53 56.2	−0.037
10	5 14 53.75	2.5805	20 53 49.6	0.183
11	5 17 28.51	2.5782	20 53 34.3	0.328
12	5 20 3.13	2.5757	20 53 10.3	0.472
13	5 22 37.59	2.5730	20 52 37.7	0.616
14	5 25 11.89	2.5703	20 51 56.4	0.760
15	5 27 46.03	2.5676	20 51 6.5	0.903
16	5 30 20.00	2.5648	20 50 8.1	1.045
17	5 32 53.80	2.5618	20 49 1.1	1.188
18	5 35 27.41	2.5586	20 47 45.6	1.329
19	5 38 0.83	2.5555	20 46 21.6	1.469
20	5 40 34.07	2.5523	20 44 49.3	1.609
21	5 43 7.11	2.5489	20 43 8.5	1.749
22	5 45 39.94	2.5455	20 41 19.4	1.888
23	5 48 12.57	2.5421	20 39 21.9	2.027
24	5 50 44.99	2.5385	+20 37 16.2	−2.163

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 14.			
	h m s	s	° ′ ″	″
0	5 50 44.99	2.5385	+20 37 16.2	−2.163
1	5 53 17.19	2.5348	20 35 2.3	2.300
2	5 55 49.16	2.5311	20 32 40.2	2.437
3	5 58 20.92	2.5273	20 30 9.9	2.572
4	6 0 52.43	2.5233	20 27 31.6	2.705
5	6 3 23.72	2.5194	20 24 45.3	2.839
6	6 5 54.76	2.5153	20 21 50.9	2.973
7	6 8 25.56	2.5113	20 18 48.6	3.103
8	6 10 56.11	2.5071	20 15 38.5	3.234
9	6 13 26.41	2.5028	20 12 20.5	3.365
10	6 15 56.45	2.4985	20 8 54.7	3.494
11	6 18 26.23	2.4942	20 5 21.2	3.623
12	6 20 55.75	2.4898	20 1 40.0	3.750
13	6 23 25.00	2.4853	19 57 51.2	3.876
14	6 25 53.98	2.4808	19 53 54.9	4.002
15	6 28 22.69	2.4761	19 49 51.0	4.127
16	6 30 51.11	2.4714	19 45 39.7	4.249
17	6 33 19.26	2.4668	19 41 21.1	4.372
18	6 35 47.13	2.4620	19 36 55.1	4.494
19	6 38 14.70	2.4572	19 32 21.8	4.614
20	6 40 41.99	2.4524	19 27 41.4	4.733
21	6 43 8.99	2.4475	19 22 53.8	4.853
22	6 45 35.69	2.4426	19 17 59.1	4.970
23	6 48 2.10	2.4377	+19 12 57.4	−5.086
	OCTOBER 15.			
0	6 50 28.21	2.4327	+19 7 48.8	−5.201
1	6 52 54.02	2.4276	19 2 33.3	5.315
2	6 55 19.52	2.4225	18 57 11.0	5.428
3	6 57 44.72	2.4174	18 51 42.0	5.540
4	7 0 9.61	2.4123	18 46 6.2	5.651
5	7 2 34.19	2.4071	18 40 23.9	5.760
6	7 4 58.46	2.4019	18 34 35.0	5.869
7	7 7 22.42	2.3967	18 28 39.6	5.977
8	7 9 46.06	2.3915	18 22 37.8	6.083
9	7 12 9.40	2.3863	18 16 29.6	6.188
10	7 14 32.41	2.3809	18 10 15.2	6.293
11	7 16 55.11	2.3757	18 3 54.5	6.396
12	7 19 17.49	2.3703	17 57 27.7	6.498
13	7 21 39.55	2.3650	17 50 54.8	6.598
14	7 24 1.29	2.3598	17 44 15.9	6.698
15	7 26 22.72	2.3544	17 37 31.1	6.796
16	7 28 43.82	2.3490	17 30 40.4	6.894
17	7 31 4.60	2.3437	17 23 43.8	6.990
18	7 33 25.06	2.3383	17 16 41.6	7.084
19	7 35 45.20	2.3330	17 9 33.7	7.178
20	7 38 5.02	2.3276	17 2 20.2	7.272
21	7 40 24.51	2.3223	16 55 1.1	7.363
22	7 42 43.69	2.3170	16 47 36.7	7.453
23	7 45 2.55	2.3116	16 40 6.8	7.543
24	7 47 21.08	2.3062	+16 32 31.8	−7.[illegible]

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 16.					OCTOBER 18.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 47 21.08	2.3062	+16 32 31.6	− 7.630	0	9 32 17.81	2.0793	+9 6 30.7	−10.536
1	7 49 39.29	2.3009	16 24 51.2	7.717	1	9 34 22.46	2.0757	8 55 57.5	10.571
2	7 51 57.19	2.2956	16 17 5.6	7.803	2	9 36 26.89	2.0719	8 45 22.2	10.605
3	7 54 14.76	2.2903	16 9 14.9	7.887	3	9 38 31.09	2.0683	8 34 44.9	10.638
4	7 56 32.02	2.2849	16 1 19.2	7.969	4	9 40 35.08	2.0648	8 24 5.6	10.670
5	7 58 48.95	2.2796	15 53 18.6	8.052	5	9 42 38.86	2.0612	8 13 24.5	10.700
6	8 1 5.57	2.2744	15 45 13.0	8.133	6	9 44 42.42	2.0576	8 2 41.6	10.731
7	8 3 21.88	2.2692	15 37 2.6	8.213	7	9 46 45.77	2.0542	7 51 56.8	10.760
8	8 5 37.87	2.2638	15 28 47.5	8.292	8	9 48 48.92	2.0508	7 41 10.4	10.788
9	8 7 53.54	2.2586	15 20 27.6	8.370	9	9 50 51.87	2.0474	7 30 22.2	10.816
10	8 10 8.90	2.2533	15 12 3.1	8.446	10	9 52 54.61	2.0441	7 19 32.5	10.841
11	8 12 23.94	2.2482	15 3 34.1	8.521	11	9 54 57.16	2.0409	7 8 41.3	10.867
12	8 14 38.68	2.2431	14 55 0.6	8.595	12	9 56 59.52	2.0378	6 57 48.5	10.892
13	8 16 53.11	2.2379	14 46 22.7	8.668	13	9 59 1.69	2.0346	6 46 54.3	10.915
14	8 19 7.23	2.2328	14 37 40.5	8.739	14	10 1 3.67	2.0314	6 35 58.7	10.938
15	8 21 21.04	2.2277	14 28 54.0	8.810	15	10 3 5.46	2.0283	6 25 1.8	10.959
16	8 23 34.55	2.2226	14 20 3.3	8.880	16	10 5 7.07	2.0254	6 14 3.6	10.981
17	8 25 47.75	2.2176	14 11 8.4	8.948	17	10 7 8.51	2.0225	6 3 4.1	11.001
18	8 28 0.66	2.2126	14 2 9.5	9.016	18	10 9 9.77	2.0195	5 52 3.5	11.019
19	8 30 13.26	2.2075	13 53 6.5	9.082	19	10 11 10.85	2.0167	5 41 1.8	11.038
20	8 32 25.56	2.2026	13 43 59.7	9.147	20	10 13 11.77	2.0140	5 29 59.0	11.055
21	8 34 37.57	2.1977	13 34 48.9	9.212	21	10 15 12.53	2.0113	5 18 55.2	11.071
22	8 36 49.28	2.1928	13 25 34.3	9.274	22	10 17 13.12	2.0085	5 7 50.5	11.087
23	8 39 0.70	2.1879	+13 16 16.0	− 9.336	23	10 19 13.55	2.0059	+4 56 44.8	−11.102
	OCTOBER 17.					OCTOBER 19.			
0	8 41 11.83	2.1831	+13 6 54.0	− 9.397	0	10 21 13.83	2.0033	+4 45 38.3	−11.115
1	8 43 22.67	2.1783	12 57 28.4	9.456	1	10 23 13.95	2.0008	4 34 31.0	11.128
2	8 45 33.23	2.1736	12 47 59.3	9.514	2	10 25 13.93	1.9983	4 23 22.9	11.141
3	8 47 43.50	2.1688	12 38 26.7	9.572	3	10 27 13.75	1.9958	4 12 14.1	11.152
4	8 49 53.48	2.1641	12 28 50.6	9.628	4	10 29 13.43	1.9936	4 1 4.7	11.162
5	8 52 3.19	2.1595	12 19 11.3	9.683	5	10 31 12.98	1.9913	3 49 54.7	11.172
6	8 54 12.62	2.1549	12 9 28.6	9.738	6	10 33 12.38	1.9889	3 38 44.1	11.181
7	8 56 21.78	2.1503	11 59 42.7	9.791	7	10 35 11.65	1.9868	3 27 33.0	11.188
8	8 58 30.66	2.1458	11 49 53.7	9.843	8	10 37 10.79	1.9846	3 16 21.5	11.195
9	9 0 39.28	2.1413	11 40 1.5	9.894	9	10 39 9.80	1.9825	3 5 9.6	11.202
10	9 2 47.62	2.1368	11 30 6.4	9.944	10	10 41 8.69	1.9804	2 53 57.3	11.208
11	9 4 55.70	2.1325	11 20 8.2	9.993	11	10 43 7.45	1.9784	2 42 44.7	11.212
12	9 7 3.52	2.1282	11 10 7.2	10.041	12	10 45 6.10	1.9765	2 31 31.9	11.215
13	9 9 11.08	2.1238	11 0 3.3	10.088	13	10 47 4.63	1.9746	2 20 18.9	11.218
14	9 11 18.38	2.1195	10 49 56.7	10.133	14	10 49 3.05	1.9728	2 9 5.7	11.221
15	9 13 25.42	2.1153	10 39 47.3	10.178	15	10 51 1.36	1.9709	1 57 52.4	11.222
16	9 15 32.21	2.1112	10 29 35.3	10.222	16	10 52 59.56	1.9692	1 46 39.1	11.223
17	9 17 38.76	2.1070	10 19 20.7	10.264	17	10 54 57.66	1.9675	1 35 25.7	11.223
18	9 19 45.05	2.1029	10 9 3.6	10.307	18	10 56 55.66	1.9658	1 24 12.4	11.221
19	9 21 51.11	2.0989	9 58 43.9	10.348	19	10 58 53.56	1.9643	1 12 59.2	11.219
20	9 23 56.92	2.0948	9 48 21.9	10.387	20	11 0 51.37	1.9628	1 1 46.1	11.217
21	9 26 2.49	2.0909	9 37 57.5	10.426	21	11 2 49.09	1.9613	0 50 33.2	11.213
22	9 28 7.83	2.0871	9 27 30.8	10.464	22	11 4 46.72	1.9598	0 39 20.5	11.209
23	9 30 12.94	2.0832	9 17 1.8	10.501	23	11 6 44.26	1.9583	0 28 8.1	11.204
24	9 32 17.81	2.0793	+ 9 6 30.7	−10.536	24	11 8 41.72	1.9570	+0 16 56.0	−11.198

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 20.					OCTOBER 22.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 8 41.72	1.9570	+0 16 56.0	–11.198	0	12 41 57.56	1.9452	– 8 19 44.0	–10.053
1	11 10 39.10	1.9558	+0 5 44.3	11.192	1	12 43 54.29	1.9459	8 29 46.0	10.013
2	11 12 36.41	1.9545	–0 5 27.0	11.184	2	12 45 51.07	1.9467	8 39 45.5	9.970
3	11 14 33.64	1.9533	0 16 37.8	11.177	3	12 47 47.89	1.9474	8 49 42.4	9.928
4	11 16 30.80	1.9521	0 27 48.2	11.168	4	12 49 44.76	1.9483	8 59 36.8	9.885
5	11 18 27.89	1.9510	0 38 57.9	11.158	5	12 51 41.68	1.9491	9 9 28.6	9.841
6	11 20 24.92	1.9500	0 50 7.1	11.148	6	12 53 38.65	1.9499	9 19 17.7	9.797
7	11 22 21.89	1.9489	1 1 15.6	11.137	7	12 55 35.67	1.9508	9 29 4.2	9.752
8	11 24 18.79	1.9480	1 12 23.5	11.125	8	12 57 32.75	1.9518	9 38 47.9	9.706
9	11 26 15.65	1.9472	1 23 30.6	11.112	9	12 59 29.88	1.9528	9 48 28.9	9.660
10	11 28 12.45	1.9463	1 34 36.9	11.098	10	13 1 27.08	1.9538	9 58 7.1	9.613
11	11 30 9.20	1.9454	1 45 42.4	11.084	11	13 3 24.33	1.9547	10 7 42.4	9.564
12	11 32 5.90	1.9447	1 56 47.0	11.069	12	13 5 21.64	1.9558	10 17 14.8	9.516
13	11 34 2.56	1.9439	2 7 50.7	11.053	13	13 7 19.02	1.9568	10 26 44.3	9.468
14	11 35 59.17	1.9433	2 18 53.4	11.038	14	13 9 16.46	1.9579	10 36 10.9	9.418
15	11 37 55.75	1.9427	2 29 55.2	11.020	15	13 11 13.97	1.9590	10 45 34.4	9.368
16	11 39 52.29	1.9420	2 40 55.8	11.002	16	13 13 11.54	1.9602	10 54 55.0	9.317
17	11 41 48.79	1.9415	2 51 55.4	10.984	17	13 15 9.19	1.9613	11 4 12.4	9.265
18	11 43 45.27	1.9410	3 2 53.9	10.964	18	13 17 6.90	1.9625	11 13 26.8	9.213
19	11 45 41.71	1.9407	3 13 51.1	10.943	19	13 19 4.69	1.9638	11 22 38.0	9.160
20	11 47 38.13	1.9402	3 24 47.1	10.923	20	13 21 2.55	1.9649	11 31 46.0	9.106
21	11 49 34.53	1.9398	3 35 41.9	10.902	21	13 23 0.48	1.9662	11 40 50.7	9.053
22	11 51 30.91	1.9395	3 46 35.3	10.879	22	13 24 58.49	1.9675	11 49 52.3	8.998
23	11 53 27.27	1.9392	–3 57 27.4	–10.857	23	13 26 56.58	1.9688	–11 58 50.5	– 8.942
	OCTOBER 21.					OCTOBER 23.			
0	11 55 23.61	1.9389	–4 8 18.1	–10.833	0	13 28 54.75	1.9702	–12 7 45.3	– 8.886
1	11 57 19.94	1.9388	4 19 7.3	10.808	1	13 30 53.00	1.9715	12 16 36.8	8.830
2	11 59 16.26	1.9386	4 29 55.1	10.783	2	13 32 51.33	1.9728	12 25 24.9	8.773
3	12 1 12.57	1.9385	4 40 41.3	10.757	3	13 34 49.74	1.9742	12 34 9.5	8.715
4	12 3 8.88	1.9384	4 51 25.9	10.731	4	13 36 48.23	1.9756	12 42 50.7	8.657
5	12 5 5.18	1.9384	5 2 9.0	10.703	5	13 38 46.81	1.9770	12 51 28.3	8.598
6	12 7 1.49	1.9384	5 12 50.3	10.675	6	13 40 45.47	1.9784	13 0 2.4	8.538
7	12 8 57.79	1.9384	5 23 30.0	10.648	7	13 42 44.22	1.9799	13 8 32.8	8.477
8	12 10 54.10	1.9386	5 34 8.0	10.618	8	13 44 43.06	1.9814	13 16 59.6	8.417
9	12 12 50.42	1.9388	5 44 44.1	10.588	9	13 46 41.99	1.9828	13 25 22.8	8.356
10	12 14 46.75	1.9389	5 55 18.5	10.557	10	13 48 41.00	1.9843	13 33 42.3	8.293
11	12 16 43.09	1.9391	6 5 50.9	10.525	11	13 50 40.11	1.9859	13 41 58.0	8.230
12	12 18 39.44	1.9303	6 16 21.5	10.493	12	13 52 39.31	1.9874	13 50 9.9	8.167
13	12 20 35.81	1.9396	6 26 50.1	10.460	13	13 54 38.60	1.9889	13 58 18.0	8.103
14	12 22 32.19	1.9399	6 37 16.7	10.427	14	13 56 37.98	1.9904	14 6 22.3	8.039
15	12 24 28.60	1.9403	6 47 41.3	10.393	15	13 58 37.45	1.9920	14 14 22.7	7.974
16	12 26 25.03	1.9408	6 58 3.8	10.357	16	14 0 37.02	1.9936	14 22 19.2	7.908
17	12 28 21.49	1.9412	7 8 24.1	10.322	17	14 2 36.68	1.9952	14 30 11.7	7.842
18	12 30 17.97	1.9416	7 18 42.4	10.286	18	14 4 36.44	1.9968	14 38 0.2	7.776
19	12 32 14.48	1.9422	7 28 58.4	10.248	19	14 6 36.29	1.9983	14 45 44.8	7.709
20	12 34 11.03	1.9427	7 39 12.2	10.210	20	14 8 36.24	2.0000	14 53 25.3	7.641
21	12 36 7.60	1.9433	7 49 23.6	10.172	21	14 10 36.29	2.0017	15 1 1.7	7.572
22	12 38 4.22	1.9439	7 59 32.8	10.133	22	14 12 36.44	2.0033	15 8 33.9	7.503
23	12 40 0.87	1.9445	8 9 39.6	10.093	23	14 14 36.68	2.0048	15 16 2.1	7.434
24	12 41 57.56	1.9452	–8 19 44.0	–10.053	24	14 16 37.02	2.0065	–15 23 26.0	– 7.[illegible]

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 24.					OCTOBER 26.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 16 37.02	2.0065	−15 23 26.0	−7.363	0	15 54 47.06	2.0803	−19 46 52.6	−3.448
1	14 18 37.46	2.0081	15 30 45.7	7.293	1	15 56 51.92	2.0816	19 50 16.7	3.357
2	14 20 37.99	2.0098	15 38 1.2	7.223	2	15 58 56.85	2.0827	19 53 35.4	3.266
3	14 22 38.63	2.0114	15 45 12.4	7.151	3	16 1 1.84	2.0838	19 56 48.6	3.173
4	14 24 39.36	2.0131	15 52 19.3	7.078	4	16 3 6.91	2.0851	19 59 56.2	3.082
5	14 26 40.20	2.0148	15 59 21.8	7.006	5	16 5 12.05	2.0862	20 2 58.4	2.990
6	14 28 41.13	2.0164	16 6 20.0	6.933	6	16 7 17.25	2.0872	20 5 55.0	2.898
7	14 30 42.17	2.0182	16 13 13.7	6.858	7	16 9 22.51	2.0883	20 8 46.1	2.805
8	14 32 43.31	2.0198	16 20 3.0	6.784	8	16 11 27.84	2.0893	20 11 31.6	2.713
9	14 34 44.54	2.0214	16 26 47.8	6.710	9	16 13 33.23	2.0903	20 14 11.6	2.619
10	14 36 45.88	2.0232	16 33 28.2	6.635	10	16 15 38.68	2.0913	20 16 45.9	2.526
11	14 38 47.32	2.0248	16 40 4.0	6.558	11	16 17 44.19	2.0923	20 19 14.7	2.433
12	14 40 48.85	2.0265	16 46 35.2	6.483	12	16 19 49.75	2.0932	20 21 37.8	2.338
13	14 42 50.49	2.0281	16 53 1.9	6.406	13	16 21 55.37	2.0942	20 23 55.3	2.245
14.	14 44 52.22	2.0297	16 59 23.9	6.328	14	16 24 1.05	2.0951	20 26 7.2	2.151
15	14 46 54.05	2.0314	17 5 41.3	6.251	15	16 26 6.78	2.0959	20 28 13.4	2.056
16	14 48 55.99	2.0331	17 11 54.0	6.172	16	16 28 12.56	2.0967	20 30 13.9	1.962
17	14 50 58.02	2.0347	17 18 1.9	6.093	17	16 30 18.38	2.0975	20 32 8.8	1.867
18	14 53 0.15	2.0363	17 24 5.2	6.015	18	16 32 24.26	2.0983	20 33 57.9	1.772
19	14 55 2.38	2.0380	17 30 3.7	5.935	19	16 34 30.18	2.0991	20 35 41.4	1.677
20	14 57 4.71	2.0396	17 35 57.4	5.855	20	16 36 36.15	2.0998	20 37 19.1	1.582
21	14 59 7.13	2.0413	17 41 46.3	5.774	21	16 38 42.16	2.1006	20 38 51.2	1.487
22	15 1 9.66	2.0429	17 47 30.3	5.694	22	16 40 48.22	2.1013	20 40 17.5	1.391
23	15 3 12.28	2.0444	−17 53 9.4	−5.612	23	16 42 54.31	2.1018	−20 41 38.1	−1.295
	OCTOBER 25.					OCTOBER 27.			
0	15 5 14.99	2.0460	−17 58 43.7	−5.530	0	16 45 0.44	2.1025	−20 42 52.9	−1.199
1	15 7 17.80	2.0476	18 4 13.0	5.448	1	16 47 6.61	2.1032	20 44 2.0	1.103
2	15 9 20.70	2.0492	18 9 37.4	5.365	2	16 49 12.82	2.1037	20 45 5.3	1.008
3	15 11 23.70	2.0508	18 14 56.8	5.282	3	16 51 19.05	2.1042	20 46 2.9	0.912
4	15 13 26.80	2.0523	18 20 11.2	5.198	4	16 53 25.32	2.1048	20 46 54.7	0.815
5	15 15 29.98	2.0538	18 25 20.5	5.113	5	16 55 31.62	2.1053	20 47 40.7	0.718
6	15 17 33.26	2.0554	18 30 24.8	5.030	6	16 57 37.95	2.1058	20 48 20.9	0.623
7	15 19 36.63	2.0569	18 35 24.1	4.945	7	16 59 44.31	2.1062	20 48 55.4	0.526
8	15 21 40.09	2.0584	18 40 18.2	4.859	8	17 1 50.69	2.1065	20 49 24.0	0.429
9	15 23 43.64	2.0599	18 45 7.2	4.774	9	17 3 57.09	2.1068	20 49 46.9	0.333
10	15 25 47.28	2.0614	18 49 51.1	4.688	10	17 6 3.51	2.1073	20 50 4.0	0.236
11	15 27 51.01	2.0629	18 54 29.8	4.602	11	17 8 9.96	2.1076	20 50 15.2	0.139
12	15 29 54.83	2.0643	18 59 3.3	4.515	12	17 10 16.42	2.1078	20 50 20.7	−0.043
13	15 31 58.73	2.0658	19 3 31.6	4.428	13	17 12 22.90	2.1082	20 50 20.4	+0.054
14	15 34 2.72	2.0672	19 7 54.6	4.340	14	17 14 29.40	2.1084	20 50 14.2	0.153
15	15 36 6.79	2.0685	19 12 12.4	4.253	15	17 16 35.91	2.1086	20 50 2.2	0.248
16	15 38 10.94	2.0699	19 16 24.9	4.165	16	17 18 42.43	2.1088	20 49 44.4	0.345
17	15 40 15.18	2.0713	19 20 32.2	4.077	17	17 20 48.96	2.1089	20 49 20.8	0.442
18	15 42 19.50	2.0727	19 24 34.1	3.987	18	17 22 55.50	2.1091	20 48 51.4	0.538
19	15 44 23.90	2.0740	19 28 30.6	3.898	19	17 25 2.05	2.1092	20 48 16.2	0.636
20	15 46 28.38	2.0753	19 32 21.8	3.808	20	17 27 8.60	2.1093	20 47 35.1	0.733
21	15 48 32.93	2.0766	19 36 7.6	3.718	21	17 29 15.16	2.1093	20 46 48.3	0.829
22	15 50 37.57	2.0779	19 39 48.0	3.628	22	17 31 21.72	2.1093	20 45 55.6	0.927
23	15 52 42.28	2.0791	19 43 23.0	3.538	23	17 33 28.28	2.1093	20 44 57.1	1.023
24	*15 54 47.06*	*2.0803*	*−19 46 52.6*	−3.448	24	17 35 34.84	2.1093	−20 43 52.8	+1.120

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 28.					OCTOBER 30.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 35 34.84	2.1093	−20 43 52.8	+1.120	0	19 16 25.15	2.0868	−18 0 47.6	+5.604
1	17 37 41.40	2.1093	20 42 42.7	1.217	1	19 18 30.34	2.0861	17 55 8.7	5.692
2	17 39 47.96	2.1093	20 41 26.8	1.313	2	19 20 35.48	2.0854	17 49 24.6	5.779
3	17 41 54.51	2.1091	20 40 5.1	1.410	3	19 22 40.59	2.0848	17 43 35.2	5.866
4	17 44 1.05	2.1090	20 38 37.6	1.507	4	19 24 45.65	2.0840	17 37 40.7	5.953
5	17 46 7.59	2.1089	20 37 4.3	1.603	5	19 26 50.67	2.0833	17 31 40.9	6.040
6	17 48 14.12	2.1087	20 35 25.2	1.700	6	19 28 55.65	2.0827	17 25 35.9	6.126
7	17 50 20.63	2.1085	20 33 40.3	1.796	7	19 31 0.59	2.0820	17 19 25.8	6.211
8	17 52 27.14	2.1083	20 31 49.7	1.893	8	19 33 5.49	2.0813	17 13 10.6	6.297
9	17 54 33.63	2.1081	20 29 53.2	1.989	9	19 35 10.34	2.0806	17 6 50.2	6.383
10	17 56 40.11	2.1078	20 27 51.0	2.084	10	19 37 15.16	2.0799	17 0 24.7	6.467
11	17 58 46.57	2.1075	20 25 43.1	2.180	11	19 39 19.93	2.0793	16 53 54.2	6.551
12	18 0 53.01	2.1073	20 23 29.4	2.276	12	19 41 24.67	2.0787	16 47 18.6	6.635
13	18 2 59.44	2.1069	20 21 10.0	2.372	13	19 43 29.37	2.0780	16 40 38.0	6.719
14	18 5 5.84	2.1065	20 18 44.8	2.468	14	19 45 34.03	2.0773	16 33 52.3	6.803
15	18 7 12.22	2.1063	20 16 13.8	2.563	15	19 47 38.65	2.0768	16 27 1.7	6.885
16	18 9 18.59	2.1058	20 13 37.2	2.658	16	19 49 43.24	2.0762	16 20 6.1	6.968
17	18 11 24.92	2.1054	20 10 54.8	2.754	17	19 51 47.79	2.0756	16 13 5.5	7.051
18	18 13 31.24	2.1051	20 8 6.7	2.848	18	19 53 52.31	2.0750	16 6 0.0	7.132
19	18 15 37.53	2.1046	20 5 13.0	2.943	19	19 55 56.79	2.0744	15 58 49.7	7.213
20	18 17 43.79	2.1042	20 2 13.5	3.038	20	19 58 1.24	2.0738	15 51 34.4	7.295
21	18 19 50.03	2.1037	19 59 8.4	3.133	21	20 0 5.65	2.0733	15 44 14.3	7.375
22	18 21 56.23	2.1032	19 55 57.6	3.228	22	20 2 10.03	2.0728	15 36 49.4	7.456
23	18 24 2.41	2.1028	−19 52 41.1	+3.322	23	20 4 14.38	2.0723	−15 29 19.6	+7.536
	OCTOBER 29.					OCTOBER 31.			
0	18 26 8.56	2.1023	−19 49 19.0	+3.416	0	20 6 18.70	2.0718	−15 21 45.1	+7.615
1	18 28 14.68	2.1017	19 45 51.2	3.509	1	20 8 22.99	2.0713	15 14 5.8	7.694
2	18 30 20.76	2.1011	19 42 17.9	3.603	2	20 10 27.26	2.0708	15 6 21.8	7.773
3	18 32 26.81	2.1006	19 38 38.9	3.697	3	20 12 31.49	2.0703	14 58 33.1	7.851
4	18 34 32.83	2.1000	19 34 54.3	3.790	4	20 14 35.70	2.0700	14 50 39.7	7.929
5	18 36 38.81	2.0994	19 31 4.1	3.883	5	20 16 39.89	2.0696	14 42 41.6	8.007
6	18 38 44.76	2.0988	19 27 8.3	3.976	6	20 18 44.05	2.0692	14 34 38.9	8.083
7	18 40 50.67	2.0983	19 23 7.0	4.068	7	20 20 48.19	2.0688	14 26 31.6	8.159
8	18 42 56.55	2.0976	19 19 0.1	4.161	8	20 22 52.31	2.0685	14 18 19.8	8.236
9	18 45 2.38	2.0969	19 14 47.7	4.253	9	20 24 56.41	2.0682	14 10 3.3	8.312
10	18 47 8.18	2.0963	19 10 29.8	4.345	10	20 27 0.49	2.0678	14 1 42.4	8.386
11	18 49 13.94	2.0957	19 6 6.3	4.437	11	20 29 4.55	2.0676	13 53 17.0	8.461
12	18 51 19.66	2.0950	19 1 37.4	4.528	12	20 31 8.60	2.0673	13 44 47.1	8.535
13	18 53 25.34	2.0944	18 57 3.0	4.619	13	20 33 12.63	2.0672	13 36 12.8	8.609
14	18 55 30.99	2.0938	18 52 23.1	4.710	14	20 35 16.66	2.0670	13 27 34.0	8.683
15	18 57 36.59	2.0930	18 47 37.8	4.800	15	20 37 20.67	2.0668	13 18 50.9	8.755
16	18 59 42.15	2.0923	18 42 47.1	4.891	16	20 39 24.67	2.0667	13 10 3.4	8.828
17	19 1 47.67	2.0917	18 37 50.9	4.982	17	20 41 28.67	2.0666	13 1 11.5	8.900
18	19 3 53.15	2.0910	18 32 49.3	5.071	18	20 43 32.66	2.0665	12 52 15.4	8.970
19	19 5 58.59	2.0903	18 27 42.4	5.160	19	20 45 36.65	2.0664	12 43 15.1	9.041
20	19 8 3.99	2.0896	18 22 30.1	5.249	20	20 47 40.63	2.0663	12 34 10.5	9.112
21	19 10 9.34	2.0888	18 17 12.5	5.338	21	20 49 44.61	2.0664	12 25 1.7	9.182
22	19 12 14.65	2.0882	18 11 49.5	5.428	22	20 51 48.60	2.0665	12 15 48.7	9.251
23	19 14 19.92	2.0875	18 6 21.2	5.516	23	20 53 52.59	2.0665	12 6 31.6	9.320
24	19 16 25.15	2.0868	−18 0 47.6	+5.604	24	20 55 56.58	2.0666	−11 57 10.3	+9.388

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 1.					NOVEMBER 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 55 56.58	2.0666	−11 57 10.3	+ 9.388	0	22 36 0.01	2.1198	−3 19 21.5	+11.921
1	20 58 0.58	2.0668	11 47 45.0	9.456	1	22 38 7.26	2.1220	3 7 25.2	11.955
2	21 0 4.59	2.0669	11 38 15.6	9.523	2	22 40 14.65	2.1244	2 55 26.9	11.988
3	21 2 8.61	2.0671	11 28 42.3	9.589	3	22 42 22.19	2.1268	2 43 26.6	12.020
4	21 4 12.64	2.0673	11 19 4.9	9.656	4	22 44 29.86	2.1292	2 31 24.5	12.052
5	21 6 16.68	2.0676	11 9 23.6	9.721	5	22 46 37.69	2.1318	2 19 20.4	12.083
6	21 8 20.75	2.0679	10 59 38.4	9.786	6	22 48 45.67	2.1343	2 7 14.6	12.111
7	21 10 24.83	2.0683	10 49 49.3	9.851	7	22 50 53.80	2.1369	1 55 7.1	12.139
8	21 12 28.94	2.0687	10 39 56.3	9.914	8	22 53 2.10	2.1396	1 42 57.9	12.167
9	21 14 33.07	2.0691	10 29 59.6	9.978	9	22 55 10.55	2.1423	1 30 47.1	12.193
10	21 16 37.23	2.0695	10 19 59.0	10.041	10	22 57 19.17	2.1451	1 18 34.7	12.218
11	21 18 41.41	2.0700	10 9 54.7	10.103	11	22 59 27.96	2.1479	1 6 20.9	12.243
12	21 20 45.63	2.0706	9 59 46.7	10.164	12	23 1 36.92	2.1508	0 54 5.6	12.266
13	21 22 49.88	2.0712	9 49 35.0	10.225	13	23 3 46.06	2.1538	0 41 49.0	12.288
14	21 24 54.17	2.0718	9 39 19.7	10.285	14	23 5 55.37	2.1567	0 29 31.1	12.309
15	21 26 58.49	2.0723	9 29 0.8	10.345	15	23 8 4.86	2.1598	0 17 11.9	12.329
16	21 29 2.85	2.0731	9 18 38.3	10.404	16	23 10 14.54	2.1629	−0 4 51.6	12.348
17	21 31 7.26	2.0738	9 8 12.3	10.463	17	23 12 24.41	2.1661	+0 7 29.8	12.365
18	21 33 11.71	2.0746	8 57 42.8	10.521	18	23 14 34.47	2.1693	0 19 52.2	12.383
19	21 35 16.21	2.0755	8 47 9.8	10.578	19	23 16 44.72	2.1726	0 32 15.7	12.398
20	21 37 20.77	2.0763	8 36 33.4	10.635	20	23 18 55.18	2.1759	0 44 40.0	12.412
21	21 39 25.37	2.0772	8 25 53.6	10.691	21	23 21 5.83	2.1793	0 57 5.1	12.425
22	21 41 30.03	2.0782	8 15 10.5	10.746	22	23 23 16.69	2.1827	1 9 31.0	12.438
23	21 43 34.75	2.0792	− 8 4 24.1	+10.800	23	23 25 27.75	2.1862	+1 21 57.7	+12.449
	NOVEMBER 2.					NOVEMBER 4.			
0	21 45 39.53	2.0802	− 7 53 34.5	+10.854	0	23 27 39.03	2.1898	+1 34 24.9	+12.458
1	21 47 44.37	2.0813	7 42 41.6	10.908	1	23 29 50.52	2.1933	1 46 52.7	12.467
2	21 49 49.28	2.0824	7 31 45.6	10.959	2	23 32 2.23	2.1970	1 59 20.9	12.474
3	21 51 54.26	2.0836	7 20 46.5	11.012	3	23 34 14.16	2.2007	2 11 49.6	12.480
4	21 53 59.31	2.0848	7 9 44.2	11.063	4	23 36 26.31	2.2044	2 24 18.5	12.485
5	21 56 4.44	2.0861	6 58 38.9	11.113	5	23 38 38.69	2.2083	2 36 47.8	12.489
6	21 58 9.64	2.0874	6 47 30.6	11.163	6	23 40 51.30	2.2122	2 49 17.2	12.491
7	22 0 14.93	2.0888	6 36 19.4	11.212	7	23 43 4.15	2.2161	3 1 46.7	12.492
8	22 2 20.30	2.0902	6 25 5.2	11.260	8	23 45 17.23	2.2200	3 14 16.2	12.492
9	22 4 25.75	2.0917	6 13 48.2	11.307	9	23 47 30.55	2.2240	3 26 45.7	12.490
10	22 6 31.30	2.0933	6 2 28.4	11.353	10	23 49 44.11	2.2281	3 39 15.0	12.487
11	22 8 36.94	2.0948	5 51 5.8	11.399	11	23 51 57.92	2.2323	3 51 44.1	12.483
12	22 10 42.67	2.0963	5 39 40.5	11.444	12	23 54 11.98	2.2364	4 4 13.0	12.478
13	22 12 48.50	2.0980	5 28 12.5	11.488	13	23 56 26.29	2.2407	4 16 41.5	12.471
14	22 14 54.43	2.0998	5 16 41.9	11.533	14	23 58 40.86	2.2449	4 29 9.5	12.462
15	22 17 0.47	2.1015	5 5 8.6	11.575	15	0 0 55.68	2.2492	4 41 36.9	12.453
16	22 19 6.61	2.1033	4 53 32.9	11.617	16	0 3 10.76	2.2536	4 54 3.8	12.442
17	22 21 12.87	2.1053	4 41 54.6	11.658	17	0 5 26.11	2.2580	5 6 29.9	12.429
18	22 23 19.24	2.1071	4 30 14.0	11.698	18	0 7 41.72	2.2625	5 18 55.3	12.415
19	22 25 25.72	2.1091	4 18 30.9	11.738	19	0 9 57.61	2.2670	5 31 19.7	12.399
20	22 27 32.33	2.1112	4 6 45.5	11.776	20	0 12 13.76	2.2715	5 43 43.2	12.383
21	22 29 39.06	2.1132	3 54 57.8	11.814	21	0 14 30.19	2.2762	5 56 5.6	12.364
22	22 31 45.91	2.1153	3 43 7.8	11.851	22	0 16 46.90	2.2808	6 8 26.9	12.344
23	22 33 52.89	2.1175	3 31 15.7	11.886	23	0 19 3.88	2.2854	6 20 46.9	12.323
24	*22 36 0.01*	2.1198	− 3 19 21.5	+11.921	24	0 21 21.15	2.2902	+6 33 5.6	+12.300

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 5.					NOVEMBER 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 21 21.15	2.2902	+ 6 33 5.6	+12.300	0	2 17 15.09	2.5420	+15 26 19.6	+9.268
1	0 23 38.70	2.2949	6 45 22.9	12.276	1	2 19 47.76	2.5471	15 35 32.6	9.163
2	0 25 56.54	2.2998	6 57 38.7	12.249	2	2 22 20.74	2.5521	15 44 39.2	9.057
3	0 28 14.67	2.3046	7 9 52.8	12.222	3	2 24 54.01	2.5570	15 53 39.4	8.948
4	0 30 33.09	2.3095	7 22 5.3	12.193	4	2 27 27.58	2.5619	16 2 33.0	8.838
5	0 32 51.81	2.3144	7 34 16.0	12.163	5	2 30 1.44	2.5668	16 11 20.0	8.728
6	0 35 10.82	2.3194	7 46 24.8	12.131	6	2 32 35.60	2.5716	16 20 0.3	8.615
7	0 37 30.14	2.3244	7 58 31.7	12.098	7	2 35 10.03	2.5763	16 28 33.8	8.501
8	0 39 49.75	2.3294	8 10 36.5	12.062	8	2 37 44.75	2.5810	16 37 0.4	8.385
9	0 42 9.67	2.3345	8 22 39.1	12.024	9	2 40 19.75	2.5857	16 45 20.0	8.268
10	0 44 29.89	2.3396	8 34 39.4	11.986	10	2 42 55.03	2.5902	16 53 32.5	8.148
11	0 46 50.42	2.3448	8 46 37.4	11.946	11	2 45 30.57	2.5946	17 1 37.8	8.028
12	0 49 11.26	2.3499	8 58 32.9	11.904	12	2 48 6.38	2.5991	17 9 35.8	7.906
13	0 51 32.41	2.3551	9 10 25.9	11.861	13	2 50 42.46	2.6034	17 17 26.5	7.783
14	0 53 53.87	2.3603	9 22 16.2	11.815	14	2 53 18.79	2.6077	17 25 9.7	7.658
15	0 56 15.65	2.3656	9 34 3.7	11.768	15	2 55 55.38	2.6118	17 32 45.4	7.532
16	0 58 37.74	2.3708	9 45 48.4	11.720	16	2 58 32.21	2.6159	17 40 13.5	7.404
17	1 1 0.15	2.3762	9 57 30.1	11.670	17	3 1 9.29	2.6200	17 47 33.9	7.275
18	1 3 22.88	2.3814	10 9 8.8	11.619	18	3 3 46.61	2.6239	17 54 46.5	7.145
19	1 5 45.92	2.3868	10 20 44.4	11.566	19	3 6 24.16	2.6278	18 1 51.3	7.013
20	1 8 9.29	2.3922	10 32 16.7	11.510	20	3 9 1.94	2.6315	18 8 48.1	6.880
21	1 10 32.98	2.3975	10 43 45.6	11.453	21	3 11 39.94	2.6352	18 15 36.9	6.746
22	1 12 56.99	2.4028	10 55 11.1	11.395	22	3 14 18.16	2.6388	18 22 17.6	6.611
23	1 15 21.32	2.4083	+11 6 33.0	+11.334	23	3 16 56.59	2.6423	+18 28 50.2	+6.474
	NOVEMBER 6.					NOVEMBER 8.			
0	1 17 45.98	2.4137	+11 17 51.2	+11.273	0	3 19 35.23	2.6457	+18 35 14.5	+6.336
1	1 20 10.96	2.4191	11 29 5.7	11.209	1	3 22 14.07	2.6489	18 41 30.5	6.198
2	1 22 36.27	2.4246	11 40 16.3	11.143	2	3 24 53.10	2.6520	18 47 38.2	6.058
3	1 25 1.91	2.4300	11 51 22.9	11.076	3	3 27 32.31	2.6551	18 53 37.4	5.916
4	1 27 27.87	2.4354	12 2 25.4	11.008	4	3 30 11.71	2.6581	18 59 28.1	5.773
5	1 29 54.16	2.4409	12 13 23.8	10.938	5	3 32 51.28	2.6609	19 5 10.2	5.630
6	1 32 20.78	2.4463	12 24 17.9	10.864	6	3 35 31.02	2.6637	19 10 43.7	5.487
7	1 34 47.72	2.4518	12 35 7.5	10.790	7	3 38 10.92	2.6663	19 16 8.6	5.341
8	1 37 14.99	2.4572	12 45 52.7	10.715	8	3 40 50.97	2.6688	19 21 24.6	5.194
9	1 39 42.58	2.4626	12 56 33.3	10.638	9	3 43 31.17	2.6711	19 26 31.9	5.048
10	1 42 10.50	2.4681	13 7 9.2	10.558	10	3 46 11.50	2.6733	19 31 30.4	4.900
11	1 44 38.75	2.4735	13 17 40.2	10.477	11	3 48 51.97	2.6756	19 36 19.9	4.751
12	1 47 7.32	2.4789	13 28 6.4	10.395	12	3 51 32.57	2.6776	19 41 0.5	4.602
13	1 49 36.22	2.4843	13 38 27.6	10.310	13	3 54 13.28	2.6794	19 45 32.1	4.452
14	1 52 5.43	2.4896	13 48 43.6	10.223	14	3 56 54.10	2.6813	19 49 54.7	4.301
15	1 54 34.97	2.4950	13 58 54.4	10.135	15	3 59 35.03	2.6828	19 54 8.2	4.148
16	1 57 4.83	2.5004	14 8 59.8	10.046	16	4 2 16.04	2.6843	19 58 12.5	3.996
17	1 59 35.02	2.5058	14 18 59.9	9.955	17	4 4 57.15	2.6858	20 2 7.7	3.843
18	2 2 5.52	2.5109	14 28 54.4	9.862	18	4 7 38.33	2.6870	20 5 53.7	3.690
19	2 4 36.33	2.5162	14 38 43.3	9.767	19	4 10 19.59	2.6881	20 9 30.5	3.536
20	2 7 7.46	2.5214	14 48 26.4	9.670	20	4 13 0.90	2.6891	20 12 58.0	3.381
21	2 9 38.90	2.5267	14 58 3.7	9.573	21	4 15 42.28	2.6900	20 16 16.2	3.226
22	2 12 10.66	2.5318	15 7 35.1	9.473	22	4 18 23.70	2.6907	20 19 25.1	3.070
23	2 14 42.72	2.5369	15 17 0.4	9.371	23	4 21 5.16	2.6913	20 22 24.6	2.91
24	2 17 15.09	2.5420	+15 26 19.6	+ 9.268	24	4 23 46.65	2.6917	+20 25 14.8	

MOON, 1919.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 9.			
	h m s	s	° ′ ″	″
0	4 23 46.65	2.6917	+20 25 14.8	+2.758
1	4 26 28.16	2.6920	20 27 55.6	2.602
2	4 29 9.69	2.6923	20 30 27.0	2.445
3	4 31 51.23	2.6922	20 32 49.0	2.288
4	4 34 32.75	2.6919	20 35 1.6	2.131
5	4 37 14.26	2.6918	20 37 4.7	1.973
6	4 39 55.76	2.6914	20 38 58.3	1.816
7	4 42 37.23	2.6908	20 40 42.6	1.658
8	4 45 18.66	2.6901	20 42 17.3	1.501
9	4 48 0.04	2.6893	20 43 42.7	1.343
10	4 50 41.38	2.6884	20 44 58.5	1.185
11	4 53 22.65	2.6873	20 46 4.9	1.028
12	4 56 3.86	2.6862	20 47 1.9	0.871
13	4 58 44.99	2.6848	20 47 49.4	0.713
14	5 1 26.03	2.6833	20 48 27.5	0.556
15	5 4 6.98	2.6816	20 48 56.1	0.399
16	5 6 47.82	2.6798	20 49 15.4	0.243
17	5 9 28.56	2.6779	20 49 25.2	+0.086
18	5 12 9.17	2.6758	20 49 25.7	−0.069
19	5 14 49.66	2.6738	20 49 16.9	0.224
20	5 17 30.02	2.6714	20 48 58.8	0.380
21	5 20 10.23	2.6690	20 48 31.3	0.535
22	5 22 50.30	2.6665	20 47 54.6	0.688
23	5 25 30.21	2.6638	+20 47 8.7	−0.843
	NOVEMBER 10.			
0	5 28 9.95	2.6609	+20 46 13.5	−0.996
1	5 30 49.52	2.6579	20 45 9.2	1.148
2	5 33 28.90	2.6548	20 43 55.7	1.300
3	5 36 8.10	2.6517	20 42 33.2	1.452
4	5 38 47.10	2.6484	20 41 1.5	1.603
5	5 41 25.91	2.6450	20 39 20.9	1.752
6	5 44 4.50	2.6414	20 37 31.3	1.901
7	5 46 42.88	2.6378	20 35 32.8	2.050
8	5 49 21.03	2.6340	20 33 25.3	2.198
9	5 51 58.96	2.6302	20 31 9.1	2.344
10	5 54 36.65	2.6262	20 28 44.0	2.490
11	5 57 14.10	2.6221	20 26 10.3	2.635
12	5 59 51.30	2.6178	20 23 27.8	2.780
13	6 2 28.24	2.6135	20 20 36.7	2.923
14	6 5 4.92	2.6092	20 17 37.1	3.065
15	6 7 41.34	2.6047	20 14 28.9	3.207
16	6 10 17.48	2.6000	20 11 12.3	3.346
17	6 12 53.34	2.5954	20 7 47.4	3.486
18	6 15 28.93	2.5907	20 4 14.0	3.624
19	6 18 4.22	2.5858	20 0 32.5	3.761
20	6 20 39.22	2.5808	19 56 42.7	3.898
21	6 23 13.92	2.5758	19 52 44.8	4.033
22	6 25 48.31	2.5707	19 48 38.8	4.166
23	6 28 22.40	2.5655	19 44 24.9	4.298
24	6 30 56.17	2.5603	+19 40 3.0	−4.430

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 11.			
	h m s	s	° ′ ″	″
0	6 30 56.17	2.5603	+19 40 3.0	−4.430
1	6 33 29.63	2.5549	19 35 33.3	4.560
2	6 36 2.76	2.5494	19 30 55.8	4.690
3	6 38 35.56	2.5440	19 26 10.5	4.818
4	6 41 8.04	2.5386	19 21 17.7	4.943
5	6 43 40.19	2.5329	19 16 17.3	5.069
6	6 46 11.99	2.5273	19 11 9.4	5.194
7	6 48 43.46	2.5216	19 5 54.0	5.317
8	6 51 14.58	2.5158	19 0 31.4	5.438
9	6 53 45.35	2.5100	18 55 1.5	5.558
10	6 56 15.78	2.5042	18 49 24.4	5.678
11	6 58 45.85	2.4982	18 43 40.1	5.796
12	7 1 15.56	2.4923	18 37 48.9	5.912
13	7 3 44.92	2.4863	18 31 50.7	6.027
14	7 6 13.91	2.4802	18 25 45.7	6.140
15	7 8 42.54	2.4741	18 19 33.9	6.253
16	7 11 10.80	2.4680	18 13 15.3	6.364
17	7 13 38.70	2.4619	18 6 50.2	6.473
18	7 16 6.23	2.4558	18 0 18.5	6.583
19	7 18 33.39	2.4495	17 53 40.3	6.689
20	7 21 0.17	2.4433	17 46 55.8	6.795
21	7 23 26.58	2.4371	17 40 4.9	6.899
22	7 25 52.62	2.4308	17 33 7.9	7.002
23	7 28 18.28	2.4245	+17 26 4.7	−7.104
	NOVEMBER 12.			
0	7 30 43.56	2.4183	+17 18 55.4	−7.204
1	7 33 8.47	2.4119	17 11 40.2	7.303
2	7 35 32.99	2.4056	17 4 19.1	7.400
3	7 37 57.14	2.3993	16 56 52.2	7.496
4	7 40 20.91	2.3930	16 49 19.6	7.590
5	7 42 44.30	2.3868	16 41 41.4	7.683
6	7 45 7.32	2.3804	16 33 57.6	7.776
7	7 47 29.95	2.3740	16 26 8.3	7.867
8	7 49 52.20	2.3677	16 18 13.6	7.955
9	7 52 14.07	2.3613	16 10 13.7	8.043
10	7 54 35.56	2.3550	16 2 8.5	8.130
11	7 56 56.67	2.3488	15 53 58.1	8.215
12	7 59 17.41	2.3425	15 45 42.7	8.298
13	8 1 37.77	2.3362	15 37 22.4	8.380
14	8 3 57.75	2.3299	15 28 57.1	8.461
15	8 6 17.36	2.3237	15 20 27.1	8.540
16	8 8 36.59	2.3174	15 11 52.3	8.619
17	8 10 55.45	2.3112	15 3 12.8	8.696
18	8 13 13.93	2.3050	14 54 28.8	8.771
19	8 15 32.05	2.2989	14 45 40.3	8.845
20	8 17 49.80	2.2927	14 36 47.4	8.918
21	8 20 7.17	2.2866	14 27 50.1	8.990
22	8 22 24.19	2.2806	14 18 48.6	9.060
23	8 24 40.84	2.2744	14 9 42.9	9.129
24	8 26 57.12	2.2683	+14 0 33.1	−9.197

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 13.					NOVEMBER 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 26 57.12	2.2683	+14 0 33.1	− 9.197	0	10 9 42.35	2.0333	+5 43 55.7	−11.078
1	8 29 13.04	2.2623	13 51 19.3	9.263	1	10 11 44.24	2.0298	5 32 50.6	11.092
2	8 31 28.60	2.2564	13 42 1.6	9.328	2	10 13 45.92	2.0263	5 21 44.7	11.105
3	8 33 43.81	2.2506	13 32 39.9	9.392	3	10 15 47.39	2.0228	5 10 38.0	11.118
4	8 35 58.66	2.2446	13 23 14.6	9.454	4	10 17 48.66	2.0195	4 59 30.5	11.130
5	8 38 13.16	2.2387	13 13 45.4	9.516	5	10 19 49.73	2.0162	4 48 22.4	11.140
6	8 40 27.30	2.2328	13 4 12.7	9.575	6	10 21 50.60	2.0130	4 37 13.7	11.150
7	8 42 41.10	2.2271	12 54 36.4	9.634	7	10 23 51.29	2.0099	4 26 4.4	11.159
8	8 44 54.55	2.2213	12 44 56.6	9.692	8	10 25 51.79	2.0068	4 14 54.6	11.168
9	8 47 7.66	2.2157	12 35 13.4	9.748	9	10 27 52.10	2.0038	4 3 44.3	11.175
10	8 49 20.43	2.2100	12 25 26.8	9.803	10	10 29 52.24	2.0008	3 52 33.6	11.182
11	8 51 32.86	2.2043	12 15 37.0	9.857	11	10 31 52.20	1.9978	3 41 22.5	11.188
12	8 53 44.95	2.1988	12 5 44.0	9.909	12	10 33 51.98	1.9950	3 30 11.1	11.193
13	8 55 56.71	2.1933	11 55 47.9	9.961	13	10 35 51.60	1.9923	3 18 59.4	11.197
14	8 58 8.14	2.1878	11 45 48.7	10.011	14	10 37 51.05	1.9895	3 7 47.5	11.200
15	9 0 19.24	2.1823	11 35 46.6	10.060	15	10 39 50.34	1.9869	2 56 35.4	11.203
16	9 2 30.02	2.1769	11 25 41.5	10.108	16	10 41 49.48	1.9843	2 45 23.2	11.204
17	9 4 40.47	2.1716	11 15 33.6	10.155	17	10 43 48.46	1.9817	2 34 10.9	11.205
18	9 6 50.61	2.1663	11 5 22.9	10.200	18	10 45 47.28	1.9793	2 22 58.6	11.206
19	9 9 0.43	2.1611	10 55 9.6	10.245	19	10 47 45.97	1.9768	2 11 46.2	11.205
20	9 11 9.94	2.1558	10 44 53.5	10.288	20	10 49 44.50	1.9744	2 0 34.0	11.203
21	9 13 19.13	2.1507	10 34 35.0	10.330	21	10 51 42.90	1.9722	1 49 21.8	11.202
22	9 15 28.02	2.1457	10 24 13.9	10.373	22	10 53 41.16	1.9699	1 38 9.8	11.198
23	9 17 36.61	2.1406	+10 13 50.3	−10.413	23	10 55 39.29	1.9678	+1 26 58.0	−11.195
	NOVEMBER 14.					NOVEMBER 16.			
0	9 19 44.89	2.1356	+10 3 24.4	−10.451	0	10 57 37.29	1.9657	+1 15 46.4	−11.191
1	9 21 52.88	2.1307	9 52 56.2	10.488	1	10 59 35.17	1.9636	1 4 35.1	11.185
2	9 24 0.57	2.1258	9 42 25.8	10.525	2	11 1 32.92	1.9615	0 53 24.2	11.179
3	9 26 7.97	2.1210	9 31 53.2	10.561	3	11 3 30.55	1.9596	0 42 13.6	11.173
4	9 28 15.09	2.1163	9 21 18.5	10.596	4	11 5 28.07	1.9578	0 31 3.5	11.166
5	9 30 21.92	2.1115	9 10 41.7	10.629	5	11 7 25.48	1.9559	0 19 53.7	11.158
6	9 32 28.47	2.1068	9 0 3.0	10.662	6	11 9 22.78	1.9542	+0 8 44.5	11.148
7	9 34 34.74	2.1023	8 49 22.3	10.693	7	11 11 19.98	1.9524	−0 2 24.1	11.139
8	9 36 40.74	2.0978	8 38 39.8	10.723	8	11 13 17.07	1.9508	0 13 32.2	11.129
9	9 38 46.47	2.0933	8 27 55.5	10.753	9	11 15 14.07	1.9492	0 24 39.6	11.118
10	9 40 51.93	2.0888	8 17 9.5	10.781	10	11 17 10.97	1.9476	0 35 46.4	11.108
11	9 42 57.13	2.0845	8 6 21.8	10.809	11	11 19 7.78	1.9462	0 46 52.5	11.095
12	9 45 2.07	2.0802	7 55 32.4	10.836	12	11 21 4.51	1.9448	0 57 57.8	11.082
13	9 47 6.75	2.0759	7 44 41.5	10.860	13	11 23 1.15	1.9433	1 9 2.3	11.068
14	9 49 11.18	2.0718	7 33 49.2	10.885	14	11 24 57.71	1.9421	1 20 5.9	11.053
15	9 51 15.36	2.0676	7 22 55.3	10.908	15	11 26 54.20	1.9408	1 31 8.7	11.038
16	9 53 19.29	2.0635	7 12 0.2	10.931	16	11 28 50.61	1.9396	1 42 10.5	11.023
17	9 55 22.98	2.0595	7 1 3.6	10.953	17	11 30 46.95	1.9384	1 53 11.4	11.007
18	9 57 26.43	2.0556	6 50 5.9	10.973	18	11 32 43.22	1.9373	2 4 11.3	10.989
19	9 59 29.65	2.0518	6 39 6.9	10.993	19	11 34 39.43	1.9363	2 15 10.1	10.971
20	10 1 32.64	2.0479	6 28 6.7	11.012	20	11 36 35.58	1.9354	2 26 7.8	10.953
21	10 3 35.40	2.0441	6 17 5.5	11.029	21	11 38 31.68	1.9345	2 37 4.5	10.934
22	10 5 37.93	2.0404	6 6 3.2	11.047	22	11 40 27.72	1.9335	2 47 59.9	10.913
23	10 7 40.25	2.0368	5 54 59.9	11.063	23	11 42 23.70	1.9327	2 58 54.1	10.893
24	10 9 42.35	2.0333	+ 5 43 55.7	−11.078	24	11 44 19.64	1.9319	−3 9 47.1	−10.873

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 17.					NOVEMBER 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 44 19.64	1.9319	− 3 9 47.1	−10.873	0	13 17 4.90	1.9490	−11 15 13.8	−9.116
1	11 46 15.53	1.9313	3 20 38.8	10.851	1	13 19 1.88	1.9503	11 24 19.2	9.065
2	11 48 11.39	1.9306	3 31 29.2	10.828	2	13 20 58.93	1.9516	11 33 21.6	9.013
3	11 50 7.20	1.9299	3 42 18.2	10.805	3	13 22 56.07	1.9529	11 42 20.7	8.959
4	11 52 2.98	1.9293	3 53 5.8	10.781	4	13 24 53.28	1.9543	11 51 16.7	8.907
5	11 53 58.72	1.9288	4 3 51.9	10.757	5	13 26 50.58	1.9557	12 0 9.5	8.853
6	11 55 54.44	1.9284	4 14 36.6	10.733	6	13 28 47.96	1.9571	12 8 59.0	8.798
7	11 57 50.13	1.9280	4 25 19.8	10.707	7	13 30 45.43	1.9586	12 17 45.2	8.743
8	11 59 45.80	1.9277	4 36 1.4	10.680	8	13 32 42.99	1.9600	12 26 28.1	8.687
9	12 1 41.45	1.9273	4 46 41.4	10.653	9	13 34 40.63	1.9615	12 35 7.6	8.631
10	12 3 37.08	1.9271	4 57 19.7	10.625	10	13 36 38.37	1.9630	12 43 43.8	8.574
11	12 5 32.70	1.9268	5 7 56.4	10.598	11	13 38 36.19	1.9645	12 52 16.5	8.516
12	12 7 28.30	1.9267	5 18 31.4	10.568	12	13 40 34.11	1.9661	13 0 45.7	8.458
13	12 9 23.90	1.9266	5 29 4.6	10.539	13	13 42 32.12	1.9677	13 9 11.4	8.399
14	12 11 19.49	1.9265	5 39 36.1	10.509	14	13 44 30.23	1.9693	13 17 33.6	8.341
15	12 13 15.08	1.9265	5 50 5.7	10.478	15	13 46 28.44	1.9709	13 25 52.3	8.281
16	12 15 10.67	1.9265	6 0 33.4	10.447	16	13 48 26.74	1.9725	13 34 7.3	8.220
17	12 17 6.26	1.9266	6 10 59.3	10.415	17	13 50 25.14	1.9742	13 42 18.7	8.159
18	12 19 1.86	1.9267	6 21 23.2	10.382	18	13 52 23.64	1.9759	13 50 26.4	8.098
19	12 20 57.46	1.9268	6 31 45.1	10.348	19	13 54 22.25	1.9776	13 58 30.4	8.035
20	12 22 53.08	1.9271	6 42 5.0	10.315	20	13 56 20.95	1.9793	14 6 30.6	7.973
21	12 24 48.71	1.9273	6 52 22.9	10.280	21	13 58 19.76	1.9811	14 14 27.1	7.910
22	12 26 44.36	1.9277	7 2 38.6	10.244	22	14 0 18.68	1.9828	14 22 19.8	7.846
23	12 28 40.03	1.9280	− 7 12 52.2	−10.209	23	14 2 17.70	1.9845	−14 30 8.6	−7.782
	NOVEMBER 18.					NOVEMBER 20.			
0	12 30 35.72	1.9283	− 7 23 3.7	−10.173	0	14 4 16.82	1.9863	−14 37 53.6	−7.717
1	12 32 31.43	1.9288	7 33 13.0	10.136	1	14 6 16.05	1.9881	14 45 34.6	7.651
2	12 34 27.17	1.9293	7 43 20.0	10.098	2	14 8 15.39	1.9898	14 53 11.7	7.585
3	12 36 22.94	1.9298	7 53 24.8	10.060	3	14 10 14.83	1.9917	15 0 44.8	7.518
4	12 38 18.74	1.9303	8 3 27.2	10.021	4	14 12 14.39	1.9935	15 8 13.9	7.452
5	12 40 14.58	1.9309	8 13 27.3	9.982	5	14 14 14.05	1.9953	15 15 39.0	7.383
6	12 42 10.45	1.9315	8 23 25.0	9.943	6	14 16 13.82	1.9972	15 22 59.9	7.315
7	12 44 6.36	1.9322	8 33 20.4	9.901	7	14 18 13.71	1.9990	15 30 16.8	7.247
8	12 46 2.31	1.9328	8 43 13.1	9.858	8	14 20 13.70	2.0008	15 37 29.5	7.177
9	12 47 58.30	1.9336	8 53 3.4	9.817	9	14 22 13.81	2.0027	15 44 38.0	7.107
10	12 49 54.34	1.9344	9 2 51.2	9.775	10	14 24 14.02	2.0045	15 51 42.3	7.036
11	12 51 50.43	1.9353	9 12 36.4	9.732	11	14 26 14.35	2.0064	15 58 42.3	6.965
12	12 53 46.57	1.9361	9 22 19.0	9.688	12	14 28 14.79	2.0083	16 5 38.1	6.894
13	12 55 42.76	1.9370	9 31 59.0	9.643	13	14 30 15.34	2.0102	16 12 29.6	6.822
14	12 57 39.01	1.9379	9 41 36.2	9.598	14	14 32 16.01	2.0121	16 19 16.7	6.748
15	12 59 35.31	1.9388	9 51 10.8	9.553	15	14 34 16.79	2.0139	16 25 59.4	6.676
16	13 1 31.67	1.9398	10 0 42.6	9.508	16	14 36 17.68	2.0158	16 32 37.8	6.603
17	13 3 28.09	1.9408	10 10 11.7	9.461	17	14 38 18.69	2.0178	16 39 11.7	6.528
18	13 5 24.57	1.9419	10 19 37.9	9.413	18	14 40 19.81	2.0196	16 45 41.1	6.453
19	13 7 21.12	1.9431	10 29 1.2	9.365	19	14 42 21.04	2.0215	16 52 6.1	6.378
20	13 9 17.74	1.9442	10 38 21.7	9.317	20	14 44 22.39	2.0234	16 58 26.5	6.302
21	13 11 14.42	1.9453	10 47 39.2	9.267	21	14 46 23.85	2.0253	17 4 42.3	6.226
22	13 13 11.17	1.9465	10 56 53.7	9.218	22	14 48 25.42	2.0272	17 10 53.6	6.150
23	13 15 8.00	1.9478	11 6 5.3	9.168	23	14 50 27.11	2.0291	17 17 0.3	6.073
24	13 17 4.90	1.9490	−11 15 13.8	− 9.116	24	14 52 28.91	2.0309	−17 23 2.3	−5.995

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 21.					NOVEMBER 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 52 28.91	2.0309	−17 23 2.3	−5.995	0	16 31 52.31	2.1022	−20 33 3.6	−1.786
1	14 54 30.82	2.0328	17 28 59.7	5.917	1	16 33 58.47	2.1030	20 34 47.9	1.690
2	14 56 32.85	2.0347	17 34 52.3	5.838	2	16 36 4.67	2.1038	20 36 26.4	1.595
3	14 58 34.98	2.0365	17 40 40.2	5.758	3	16 38 10.92	2.1046	20 37 59.3	1.500
4	15 0 37.23	2.0384	17 46 23.3	5.679	4	16 40 17.22	2.1053	20 39 26.4	1.403
5	15 2 39.59	2.0402	17 52 1.7	5.599	5	16 42 23.56	2.1061	20 40 47.7	1.308
6	15 4 42.05	2.0420	17 57 35.2	5.518	6	16 44 29.95	2.1068	20 42 3.3	1.213
7	15 6 44.63	2.0439	18 3 3.8	5.437	7	16 46 36.37	2.1074	20 43 13.2	1.117
8	15 8 47.32	2.0457	18 8 27.6	5.356	8	16 48 42.84	2.1080	20 44 17.3	1.020
9	15 10 50.11	2.0475	18 13 46.5	5.274	9	16 50 49.33	2.1085	20 45 15.6	0.924
10	15 12 53.02	2.0493	18 19 0.5	5.192	10	16 52 55.86	2.1092	20 46 8.2	0.828
11	15 14 56.03	2.0510	18 24 9.5	5.108	11	16 55 2.43	2.1097	20 46 54.9	0.731
12	15 16 59.14	2.0528	18 29 13.5	5.025	12	16 57 9.02	2.1101	20 47 35.9	0.635
13	15 19 2.36	2.0546	18 34 12.5	4.942	13	16 59 15.64	2.1105	20 48 11.1	0.538
14	15 21 5.69	2.0563	18 39 6.5	4.858	14	17 1 22.28	2.1109	20 48 40.4	0.441
15	15 23 9.11	2.0579	18 43 55.4	4.773	15	17 3 28.95	2.1113	20 49 4.0	0.345
16	15 25 12.64	2.0597	18 48 39.2	4.687	16	17 5 35.64	2.1117	20 49 21.8	0.248
17	15 27 16.28	2.0614	18 53 17.8	4.602	17	17 7 42.35	2.1119	20 49 33.7	0.150
18	15 29 20.01	2.0630	18 57 51.4	4.517	18	17 9 49.07	2.1122	20 49 39.8	−0.053
19	15 31 23.84	2.0648	19 2 19.8	4.430	19	17 11 55.81	2.1124	20 49 40.1	+0.043
20	15 33 27.78	2.0664	19 6 43.0	4.343	20	17 14 2.56	2.1126	20 49 34.6	0.140
21	15 35 31.81	2.0679	19 11 1.0	4.257	21	17 16 9.32	2.1128	20 49 23.3	0.238
22	15 37 35.93	2.0695	19 15 13.8	4.169	22	17 18 16.09	2.1129	20 49 6.1	0.335
23	15 39 40.15	2.0712	−19 19 21.3	−4.082	23	17 20 22.87	2.1130	−20 48 43.1	+0.432
	NOVEMBER 22.					NOVEMBER 24.			
0	15 41 44.47	2.0728	−19 23 23.6	−3.993	0	17 22 29.65	2.1130	−20 48 14.3	+0.528
1	15 43 48.88	2.0743	19 27 20.5	3.905	1	17 24 36.43	2.1131	20 47 39.7	0.626
2	15 45 53.38	2.0758	19 31 12.2	3.816	2	17 26 43.22	2.1131	20 46 59.2	0.723
3	15 47 57.97	2.0772	19 34 58.4	3.727	3	17 28 50.00	2.1129	20 46 13.0	0.819
4	15 50 2.64	2.0787	19 38 39.4	3.638	4	17 30 56.77	2.1128	20 45 20.9	0.917
5	15 52 7.41	2.0802	19 42 14.9	3.547	5	17 33 3.54	2.1128	20 44 23.0	1.013
6	15 54 12.26	2.0815	19 45 45.0	3.458	6	17 35 10.31	2.1127	20 43 19.3	1.110
7	15 56 17.19	2.0828	19 49 9.8	3.367	7	17 37 17.06	2.1123	20 42 9.8	1.207
8	15 58 22.20	2.0843	19 52 29.0	3.276	8	17 39 23.79	2.1122	20 40 54.5	1.303
9	16 0 27.30	2.0857	19 55 42.9	3.185	9	17 41 30.52	2.1120	20 39 33.4	1.400
10	16 2 32.48	2.0869	19 58 51.2	3.093	10	17 43 37.23	2.1116	20 38 6.5	1.497
11	16 4 37.73	2.0882	20 1 54.1	3.002	11	17 45 43.91	2.1113	20 36 33.8	1.593
12	16 6 43.06	2.0895	20 4 51.4	2.909	12	17 47 50.58	2.1110	20 34 55.3	1.689
13	16 8 48.47	2.0907	20 7 43.2	2.818	13	17 49 57.23	2.1106	20 33 11.1	1.785
14	16 10 53.94	2.0918	20 10 29.5	2.725	14	17 52 3.85	2.1102	20 31 21.1	1.882
15	16 12 59.49	2.0931	20 13 10.2	2.632	15	17 54 10.45	2.1097	20 29 25.3	1.978
16	16 15 5.11	2.0942	20 15 45.3	2.538	16	17 56 17.01	2.1092	20 27 23.8	2.073
17	16 17 10.79	2.0953	20 18 14.8	2.445	17	17 58 23.55	2.1088	20 25 16.5	2.169
18	16 19 16.54	2.0963	20 20 38.7	2.352	18	18 0 30.06	2.1083	20 23 3.5	2.265
19	16 21 22.35	2.0974	20 22 57.0	2.258	19	18 2 36.54	2.1077	20 20 44.7	2.360
20	16 23 28.23	2.0984	20 25 9.6	2.163	20	18 4 42.98	2.1070	20 18 20.3	2.455
21	16 25 34.16	2.0994	20 27 16.6	2.070	21	18 6 49.38	2.1063	20 15 50.1	2.551
22	16 27 40.16	2.1004	20 29 18.0	1.975	22	18 8 55.74	2.1058	20 13 14.2	2.645
23	16 29 46.21	2.1013	20 31 13.6	1.880	23	18 11 2.07	2.1051	20 10 32.7	2.740
24	16 31 52.31	2.1022	−20 33 3.6	−1.786	24	18 13 8.35	2.1043	−20 7 45.4	+

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 25.					NOVEMBER 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 13 8.35	2.1043	−20 7 45.4	+2.835	0	19 52 58.90	2.0520	−16 8 13.0	+ 7.013
1	18 15 14.59	2.1037	20 4 52.5	2.928	1	19 55 1.99	2.0508	16 1 9.9	7.090
2	18 17 20.79	2.1028	20 1 54.0	3.023	2	19 57 5.00	2.0497	15 54 2.2	7.168
3	18 19 26.93	2.1021	19 58 49.8	3.117	3	19 59 7.95	2.0486	15 46 49.8	7.245
4	18 21 33.03	2.1013	19 55 40.0	3.210	4	20 1 10.83	2.0474	15 39 32.8	7.321
5	18 23 39.09	2.1005	19 52 24.6	3.303	5	20 3 13.64	2.0463	15 32 11.3	7.396
6	18 25 45.09	2.0996	19 49 3.6	3.397	6	20 5 16.38	2.0452	15 24 45.3	7.471
7	18 27 51.04	2.0388	19 45 37.0	3.489	7	20 7 19.06	2.0441	15 17 14.8	7.546
8	18 29 56.94	2.0978	19 42 4.9	3.582	8	20 9 21.67	2.0430	15 9 39.8	7.621
9	18 32 2.78	2.0969	19 38 27.2	3.674	9	20 11 24.22	2.0419	15 2 0.3	7.694
10	18 34 8.57	2.0960	19 34 44.0	3.767	10	20 13 26.70	2.0408	14 54 16.5	7.768
11	18 36 14.30	2.0950	19 30 55.2	3.858	11	20 15 29.12	2.0398	14 46 28.2	7.841
12	18 38 19.97	2.0940	19 27 1.0	3.949	12	20 17 31.47	2.0388	14 38 35.6	7.913
13	18 40 25.58	2.0930	19 23 1.3	4.041	13	20 19 33.77	2.0378	14 30 38.7	7.984
14	18 42 31.13	2.0920	19 18 56.1	4.132	14	20 21 36.00	2.0368	14 22 37.5	8.056
15	18 44 36.62	2.0910	19 14 45.5	4.223	15	20 23 38.18	2.0359	14 14 32.0	8.127
16	18 46 42.05	2.0900	19 10 29.4	4.313	16	20 25 40.31	2.0349	14 6 22.3	8.197
17	18 48 47.42	2.0889	19 6 7.9	4.403	17	20 27 42.37	2.0340	13 58 8.4	8.267
18	18 50 52.72	2.0878	19 1 41.1	4.493	18	20 29 44.39	2.0332	13 49 50.3	8.337
19	18 52 57.95	2.0867	18 57 8.8	4.583	19	20 31 46.35	2.0322	13 41 28.0	8.405
20	18 55 3.12	2.0856	18 52 31.2	4.671	20	20 33 48.25	2.0313	13 33 1.7	8.473
21	18 57 8.22	2.0844	18 47 48.3	4.759	21	20 35 50.11	2.0306	13 24 31.3	8.541
22	18 59 13.25	2.0833	18 43 0.1	4.848	22	20 37 51.92	2.0298	13 15 56.8	8.609
23	19 1 18.22	2.0822	−18 38 6.5	+4.937	23	20 39 53.68	2.0290	−13 7 18.2	+ 8.676
	NOVEMBER 26.					NOVEMBER 28.			
0	19 3 23.11	2.0810	−18 33 7.7	+5.024	0	20 41 55.40	2.0283	−12 58 35.7	+ 8.741
1	19 5 27.94	2.0798	18 28 3.6	5.112	1	20 43 57.07	2.0276	12 49 49.3	8.807
2	19 7 32.69	2.0786	18 22 54.3	5.198	2	20 45 58.71	2.0269	12 40 58.9	8.873
3	19 9 37.37	2.0774	18 17 39.8	5.285	3	20 48 0.30	2.0262	12 32 4.6	8.938
4	19 11 41.98	2.0763	18 12 20.1	5.372	4	20 50 1.85	2.0256	12 23 6.4	9.002
5	19 13 46.52	2.0751	18 6 55.2	5.458	5	20 52 3.37	2.0251	12 14 4.4	9.064
6	19 15 50.99	2.0738	18 1 25.2	5.543	6	20 54 4.86	2.0245	12 4 58.7	9.128
7	19 17 55.38	2.0726	17 55 50.1	5.628	7	20 56 6.31	2.0239	11 55 49.1	9.191
8	19 19 59.70	2.0714	17 50 9.9	5.713	8	20 58 7.73	2.0234	11 46 35.8	9.252
9	19 22 3.95	2.0703	17 44 24.6	5.798	9	21 0 9.12	2.0229	11 37 18.9	9.313
10	19 24 8.13	2.0690	17 38 34.2	5.881	10	21 2 10.48	2.0225	11 27 58.2	9.375
11	19 26 12.23	2.0678	17 32 38.9	5.964	11	21 4 11.82	2.0221	11 18 33.9	9.435
12	19 28 16.26	2.0666	17 26 38.5	6.048	12	21 6 13.13	2.0218	11 9 6.0	9.495
13	19 30 20.22	2.0653	17 20 33.2	6.130	13	21 8 14.43	2.0214	10 59 34.5	9.554
14	19 32 24.10	2.0641	17 14 22.9	6.213	14	21 10 15.70	2.0211	10 49 59.5	9.613
15	19 34 27.91	2.0628	17 8 7.6	6.295	15	21 12 16.96	2.0209	10 40 21.0	9.670
16	19 36 31.64	2.0616	17 1 47.5	6.376	16	21 14 18.21	2.0207	10 30 39.1	9.728
17	19 38 35.30	2.0604	16 55 22.5	6.457	17	21 16 19.44	2.0205	10 20 53.7	9.785
18	19 40 38.89	2.0593	16 48 52.7	6.538	18	21 18 20.67	2.0204	10 11 4.9	9.841
19	19 42 42.41	2.0580	16 42 18.0	6.618	19	21 20 21.89	2.0203	10 1 12.8	9.897
20	19 44 45.85	2.0568	16 35 38.5	6.699	20	21 22 23.10	2.0202	9 51 17.3	9.953
21	19 46 49.22	2.0556	16 28 54.1	6.778	21	21 24 24.31	2.0202	9 41 18.5	10.007
22	19 48 52.52	2.0544	16 22 5.2	6.855	22	21 26 25.52	2.0202	9 31 16.5	10.060
23	19 50 55.75	2.0532	16 15 11.5	6.935	23	21 28 26.73	2.0203	9 21 11.3	10.113
24	19 52 58.90	2.0520	−16 8 13.0	+7.013	24	21 30 27.95	2.0204	− 9 11 2.9	+10.166

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 29.					DECEMBER 1.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 30 27.95	2.0204	−9 11 2.9	+10.166	0	23 8 30.51	2.0858	−0 14 47.9	+11.897
1	21 32 29.18	2.0205	9 0 51.4	10.218	1	23 10 35.74	2.0885	−0 2 53.6	11.914
2	21 34 30.41	2.0207	8 50 36.7	10.270	2	23 12 41.13	2.0913	+0 9 1.8	11.930
3	21 36 31.66	2.0210	8 40 19.0	10.321	3	23 14 46.70	2.0943	0 20 58.0	11.944
4	21 38 32.93	2.0213	8 29 58.2	10.372	4	23 16 52.45	2.0973	0 32 55.1	11.958
5	21 40 34.21	2.0216	8 19 34.4	10.421	5	23 18 58.37	2.1002	0 44 53.0	11.972
6	21 42 35.52	2.0220	8 9 7.7	10.470	6	23 21 4.47	2.1033	0 56 51.7	11.984
7	21 44 36.85	2.0224	7 58 38.0	10.519	7	23 23 10.77	2.1065	1 8 51.1	11.995
8	21 46 38.21	2.0229	7 48 5.4	10.567	8	23 25 17.25	2.1097	1 20 51.1	12.005
9	21 48 39.60	2.0234	7 37 30.0	10.613	9	23 27 23.93	2.1129	1 32 51.7	12.014
10	21 50 41.02	2.0240	7 26 51.8	10.660	10	23 29 30.80	2.1163	1 44 52.8	12.023
11	21 52 42.48	2.0246	7 16 10.8	10.706	11	23 31 37.88	2.1197	1 56 54.4	12.029
12	21 54 43.97	2.0253	7 5 27.1	10.751	12	23 33 45.16	2.1231	2 8 56.3	12.035
13	21 56 45.51	2.0260	6 54 40.7	10.796	13	23 35 52.65	2.1267	2 20 58.6	12.041
14	21 58 47.09	2.0268	6 43 51.6	10.840	14	23 38 0.36	2.1303	2 33 1.2	12.045
15	22 0 48.72	2.0276	6 32 59.9	10.883	15	23 40 8.28	2.1339	2 45 4.0	12.048
16	22 2 50.40	2.0284	6 22 5.6	10.926	16	23 42 16.43	2.1376	2 57 6.9	12.049
17	22 4 52.13	2.0293	6 11 8.8	10.968	17	23 44 24.79	2.1413	3 9 9.9	12.051
18	22 6 53.92	2.0304	6 0 9.5	11.009	18	23 46 33.39	2.1453	3 21 13.0	12.051
19	22 8 55.78	2.0314	5 49 7.7	11.049	19	23 48 42.22	2.1491	3 33 16.0	12.048
20	22 10 57.69	2.0324	5 38 3.6	11.088	20	23 50 51.28	2.1530	3 45 18.8	12.046
21	22 12 59.67	2.0336	5 26 57.1	11.128	21	23 53 0.58	2.1571	3 57 21.5	12.043
22	22 15 1.72	2.0348	5 15 48.2	11.167	22	23 55 10.13	2.1612	4 9 24.0	12.038
23	22 17 3.84	2.0360	−5 4 37.1	+11.204	23	23 57 19.92	2.1653	+4 21 26.1	+12.033
	NOVEMBER 30.					DECEMBER 2.			
0	22 19 6.04	2.0373	−4 53 23.7	+11.242	0	23 59 29.96	2.1695	+4 33 27.9	+12.026
1	22 21 8.32	2.0387	4 42 8.1	11.278	1	0 1 40.26	2.1738	4 45 29.2	12.018
2	22 23 10.68	2.0400	4 30 50.4	11.313	2	0 3 50.81	2.1781	4 57 30.0	12.008
3	22 25 13.12	2.0415	4 19 30.5	11.348	3	0 6 1.63	2.1824	5 9 30.1	11.997
4	22 27 15.66	2.0430	4 8 8.6	11.382	4	0 8 12.70	2.1868	5 21 29.6	11.986
5	22 29 18.28	2.0446	3 56 44.7	11.415	5	0 10 24.05	2.1914	5 33 28.4	11.973
6	22 31 21.01	2.0463	3 45 18.8	11.448	6	0 12 35.67	2.1960	5 45 26.3	11.958
7	22 33 23.83	2.0479	3 33 50.9	11.480	7	0 14 47.57	2.2006	5 57 23.4	11.943
8	22 35 26.76	2.0497	3 22 21.2	11.511	8	0 16 59.74	2.2053	6 9 19.4	11.926
9	22 37 29.79	2.0515	3 10 49.6	11.542	9	0 19 12.20	2.2100	6 21 14.5	11.908
10	22 39 32.94	2.0533	2 59 16.2	11.571	10	0 21 24.94	2.2148	6 33 8.4	11.888
11	22 41 36.19	2.0553	2 47 41.1	11.600	11	0 23 37.97	2.2196	6 45 1.1	11.868
12	22 43 39.57	2.0573	2 36 4.2	11.628	12	0 25 51.29	2.2245	6 56 52.6	11.847
13	22 45 43.07	2.0593	2 24 25.7	11.654	13	0 28 4.91	2.2295	7 8 42.7	11.823
14	22 47 46.68	2.0613	2 12 45.7	11.681	14	0 30 18.83	2.2345	7 20 31.4	11.798
15	22 49 50.43	2.0636	2 1 4.0	11.707	15	0 32 33.05	2.2395	7 32 18.5	11.772
16	22 51 54.31	2.0658	1 49 20.9	11.731	16	0 34 47.57	2.2446	7 44 4.0	11.745
17	22 53 58.32	2.0681	1 37 36.3	11.754	17	0 37 2.40	2.2498	7 55 47.9	11.717
18	22 56 2.48	2.0704	1 25 50.4	11.778	18	0 39 17.55	2.2550	8 7 30.0	11.687
19	22 58 6.77	2.0728	1 14 3.0	11.800	19	0 41 33.00	2.2603	8 19 10.3	11.655
20	23 0 11.21	2.0753	1 2 14.4	11.821	20	0 43 48.78	2.2657	8 30 48.6	11.623
21	23 2 15.80	2.0778	0 50 24.5	11.842	21	0 46 4.88	2.2709	8 42 25.0	11.588
22	23 4 20.55	2.0804	0 38 33.4	11.861	22	0 48 21.29	2.2763	8 53 59.2	11.553
23	23 6 25.45	2.0830	0 26 41.2	11.879	23	0 50 38.04	2.2818	9 5 31.3	11.516
24	23 8 30.51	2.0858	−0 14 47.9	+11.897	24	0 52 55.11	2.2873	+9 17 1.1	+11.477

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 3.					DECEMBER 5.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 52 55.11	2.2873	+ 9 17 1.1	+11.477	0	2 49 33.09	2.5735	+17 13 48.7	+7.763
1	0 55 12.52	2.2928	9 28 28.5	11.437	1	2 52 7.67	2.5790	17 21 31.0	7.645
2	0 57 30.25	2.2984	9 39 53.5	11.396	2	2 54 42.57	2.5845	17 29 6.1	7.527
3	0 59 48.33	2.3042	9 51 16.0	11.353	3	2 57 17.81	2.5900	17 36 34.2	7.407
4	1 2 6.75	2.3098	10 2 35.9	11.308	4	2 59 53.37	2.5953	17 43 54.9	7.284
5	1 4 25.50	2.3154	10 13 53.0	11.262	5	3 2 29.25	2.6007	17 51 8.3	7.161
6	1 6 44.60	2.3213	10 25 7.3	11.215	6	3 5 5.45	2.6058	17 58 14.2	7.036
7	1 9 4.05	2.3270	10 36 18.8	11.167	7	3 7 41.95	2.6110	18 5 12.6	6.909
8	1 11 23.84	2.3328	10 47 27.3	11.115	8	3 10 18.77	2.6161	18 12 3.3	6.782
9	1 13 43.99	2.3387	10 58 32.6	11.063	9	3 12 55.88	2.6211	18 18 46.4	6.653
10	1 16 4.48	2.3445	11 9 34.8	11.010	10	3 15 33.30	2.6260	18 25 21.6	6.522
11	1 18 25.33	2.3505	11 20 33.8	10.955	11	3 18 11.00	2.6308	18 31 49.0	6.390
12	1 20 46.54	2.3564	11 31 29.4	10.898	12	3 20 48.99	2.6355	18 38 8.4	6.257
13	1 23 8.10	2.3624	11 42 21.5	10.839	13	3 23 27.26	2.6402	18 44 19.8	6.122
14	1 25 30.03	2.3684	11 53 10.1	10.779	14	3 26 5.81	2.6448	18 50 23.0	5.986
15	1 27 52.31	2.3744	12 3 55.0	10.718	15	3 28 44.63	2.6493	18 56 18.1	5.848
16	1 30 14.96	2.3805	12 14 36.2	10.655	16	3 31 23.72	2.6536	19 2 4.8	5.710
17	1 32 37.97	2.3865	12 25 13.6	10.590	17	3 34 3.06	2.6578	19 7 43.3	5.570
18	1 35 1.34	2.3927	12 35 47.0	10.523	18	3 36 42.65	2.6619	19 13 13.2	5.428
19	1 37 25.09	2.3988	12 46 16.4	10.456	19	3 39 22.49	2.6660	19 18 34.7	5.287
20	1 39 49.19	2.4048	12 56 41.7	10.386	20	3 42 2.57	2.6700	19 23 47.7	5.144
21	1 42 13.67	2.4110	13 7 2.7	10.314	21	3 44 42.89	2.6738	19 28 52.0	4.999
22	1 44 38.51	2.4172	13 17 19.4	10.242	22	3 47 23.42	2.6774	19 33 47.6	4.853
23	1 47 3.73	2.4233	+13 27 31.7	+10.168	23	3 50 4.18	2.6811	+19 38 34.4	+4.707
	DECEMBER 4.					DECEMBER 6.			
0	1 49 29.31	2.4295	+13 37 39.5	+10.091	0	3 52 45.15	2.6845	+19 43 12.4	+4.559
1	1 51 55.27	2.4357	13 47 42.6	10.013	1	3 55 26.32	2.6878	19 47 41.5	4.410
2	1 54 21.59	2.4418	13 57 41.0	9.933	2	3 58 7.69	2.6911	19 52 1.6	4.260
3	1 56 48.29	2.4480	14 7 34.6	9.853	3	4 0 49.25	2.6942	19 56 12.7	4.110
4	1 59 15.35	2.4542	14 17 23.3	9.769	4	4 3 30.99	2.6972	20 0 14.8	3.959
5	2 1 42.79	2.4603	14 27 6.9	9.684	5	4 6 12.90	2.6999	20 4 7.8	3.807
6	2 4 10.59	2.4665	14 36 45.4	9.598	6	4 8 54.98	2.7026	20 7 51.6	3.653
7	2 6 38.77	2.4727	14 46 18.7	9.511	7	4 11 37.21	2.7052	20 11 26.1	3.498
8	2 9 7.31	2.4788	14 55 46.7	9.421	8	4 14 19.60	2.7076	20 14 51.4	3.345
9	2 11 36.22	2.4849	15 5 9.2	9.329	9	4 17 2.12	2.7098	20 18 7.5	3.189
10	2 14 5.50	2.4910	15 14 26.2	9.237	10	4 19 44.78	2.7120	20 21 14.1	3.033
11	2 16 35.14	2.4971	15 23 37.6	9.143	11	4 22 27.56	2.7140	20 24 11.4	2.877
12	2 19 5.15	2.5032	15 32 43.3	9.046	12	4 25 10.46	2.7159	20 26 59.3	2.719
13	2 21 35.52	2.5093	15 41 43.1	8.948	13	4 27 53.47	2.7176	20 29 37.7	2.561
14	2 24 6.26	2.5153	15 50 37.1	8.848	14	4 30 36.57	2.7191	20 32 6.6	2.402
15	2 26 37.35	2.5213	15 59 24.9	8.747	15	4 33 19.76	2.7205	20 34 25.9	2.243
16	2 29 8.81	2.5273	16 8 6.7	8.644	16	4 36 3.03	2.7218	20 36 35.7	2.083
17	2 31 40.62	2.5331	16 16 42.2	8.540	17	4 38 46.38	2.7229	20 38 35.9	1.924
18	2 34 12.78	2.5390	16 25 11.5	8.434	18	4 41 29.78	2.7239	20 40 26.6	1.764
19	2 36 45.30	2.5449	16 33 34.3	8.326	19	4 44 13.25	2.7247	20 42 7.6	1.603
20	2 39 18.17	2.5508	16 41 50.6	8.216	20	4 46 56.75	2.7253	20 43 38.9	1.443
21	2 41 51.39	2.5565	16 50 0.2	8.105	21	4 49 40.29	2.7259	20 45 0.7	1.282
22	2 44 24.95	2.5622	16 58 3.2	7.993	22	4 52 23.86	2.7263	20 46 12.7	1.120
23	2 46 58.85	2.5678	17 5 59.4	7.879	23	4 55 7.45	2.7265	20 47 15.1	0.959
24	2 49 33.09	2.5735	+17 13 48.7	+ 7.763	24	4 57 51.04	2.7265	+20 48 7.8	+0.798

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 7.			
	h m s	s	° ′ ″	″
0	4 57 51.04	2.7265	+20 48 7.8	+0.798
1	5 0 34.63	2.7264	20 48 50.8	0.636
2	5 3 18.21	2.7261	20 49 24.1	0.474
3	5 6 1.76	2.7257	20 49 47.7	0.313
4	5 8 45.29	2.7252	20 50 1.6	+0.151
5	5 11 28.78	2.7244	20 50 5.8	−0.011
6	5 14 12.22	2.7235	20 50 0.3	0.172
7	5 16 55.60	2.7225	20 49 45.2	0.332
8	5 19 38.92	2.7213	20 49 20.5	0.493
9	5 22 22.16	2.7200	20 48 46.0	0.654
10	5 25 5.32	2.7186	20 48 2.0	0.814
11	5 27 48.39	2.7169	20 47 8.3	0.974
12	5 30 31.35	2.7151	20 46 5.1	1.133
13	5 33 14.20	2.7132	20 44 52.3	1.293
14	5 35 56.93	2.7111	20 43 30.0	1.452
15	5 38 39.53	2.7088	20 41 58.1	1.610
16	5 41 21.99	2.7064	20 40 16.8	1.767
17	5 44 4.30	2.7039	20 38 26.1	1.923
18	5 46 46.46	2.7013	20 36 26.0	2.080
19	5 49 28.45	2.6985	20 34 16.5	2.236
20	5 52 10.28	2.6956	20 31 57.7	2.391
21	5 54 51.92	2.6925	20 29 29.6	2.545
22	5 57 33.38	2.6893	20 26 52.3	2.698
23	6 0 14.64	2.6859	+20 24 5.8	−2.851
	DECEMBER 8.			
0	6 2 55.69	2.6824	+20 21 10.2	−3.003
1	6 5 36.53	2.6788	20 18 5.5	3.154
2	6 8 17.15	2.6751	20 14 51.7	3.304
3	6 10 57.54	2.6713	20 11 29.0	3.453
4	6 13 37.70	2.6673	20 7 57.4	3.601
5	6 16 17.62	2.6632	20 4 16.9	3.748
6	6 18 57.28	2.6590	20 0 27.6	3.894
7	6 21 36.70	2.6547	19 56 29.6	4.039
8	6 24 15.84	2.6503	19 52 22.9	4.183
9	6 26 54.73	2.6458	19 48 7.6	4.327
10	6 29 33.33	2.6410	19 43 43.7	4.468
11	6 32 11.65	2.6363	19 39 11.4	4.608
12	6 34 49.69	2.6315	19 34 30.7	4.748
13	6 37 27.43	2.6264	19 29 41.7	4.886
14	6 40 4.86	2.6214	19 24 44.4	5.023
15	6 42 42.00	2.6163	19 19 39.0	5.158
16	6 45 18.81	2.6110	19 14 25.5	5.293
17	6 47 55.32	2.6058	19 9 3.9	5.426
18	6 50 31.50	2.6003	19 3 34.4	5.557
19	6 53 7.35	2.5948	18 57 57.1	5.687
20	6 55 42.87	2.5892	18 52 12.0	5.816
21	6 58 18.05	2.5836	18 46 19.2	5.944
22	7 0 52.90	2.5778	18 40 18.7	6.071
23	7 3 27.39	2.5720	18 34 10.7	6.195
24	7 6 1.54	2.5663	+18 27 55.3	−6.318

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 9.			
	h m s	s	° ′ ″	″
0	7 6 1.54	2.5663	+18 27 55.3	− 6.318
1	7 8 35.34	2.5603	18 21 32.5	6.440
2	7 11 8.77	2.5543	18 15 2.5	6.560
3	7 13 41.85	2.5483	18 8 25.3	6.679
4	7 16 14.56	2.5421	18 1 41.0	6.797
5	7 18 46.90	2.5359	17 54 49.7	6.913
6	7 21 18.87	2.5298	17 47 51.5	7.027
7	7 23 50.47	2.5236	17 40 46.5	7.140
8	7 26 21.70	2.5173	17 33 34.7	7.252
9	7 28 52.54	2.5109	17 26 16.3	7.361
10	7 31 23.01	2.5046	17 18 51.4	7.469
11	7 33 53.09	2.4981	17 11 20.0	7.577
12	7 36 22.78	2.4917	17 3 42.2	7.682
13	7 38 52.09	2.4852	16 55 58.2	7.785
14	7 41 21.00	2.4787	16 48 8.0	7.888
15	7 43 49.53	2.4723	16 40 11.7	7.988
16	7 46 17.67	2.4657	16 32 9.4	8.087
17	7 48 45.41	2.4590	16 24 1.3	8.184
18	7 51 12.75	2.4525	16 15 47.3	8.280
19	7 53 39.71	2.4459	16 7 27.7	8.373
20	7 56 6.26	2.4393	15 59 2.5	8.467
21	7 58 32.42	2.4327	15 50 31.7	8.558
22	8 0 58.18	2.4260	15 41 55.5	8.648
23	8 3 23.54	2.4193	+15 33 14.0	− 8.736
	DECEMBER 10.			
0	8 5 48.50	2.4127	+15 24 27.2	− 8.823
1	8 8 13.06	2.4061	15 15 35.3	8.907
2	8 10 37.23	2.3995	15 6 38.4	8.990
3	8 13 1.00	2.3928	14 57 36.5	9.072
4	8 15 24.37	2.3862	14 48 29.8	9.152
5	8 17 47.34	2.3796	14 39 18.3	9.231
6	8 20 9.92	2.3730	14 30 2.1	9.308
7	8 22 32.10	2.3663	14 20 41.4	9.383
8	8 24 53.88	2.3598	14 11 16.1	9.458
9	8 27 15.27	2.3532	14 1 46.5	9.530
10	8 29 36.26	2.3467	13 52 12.5	9.602
11	8 31 56.87	2.3402	13 42 34.3	9.671
12	8 34 17.08	2.3336	13 32 52.0	9.738
13	8 36 36.90	2.3272	13 23 5.7	9.805
14	8 38 56.34	2.3208	13 13 15.4	9.870
15	8 41 15.39	2.3143	13 3 21.3	9.933
16	8 43 34.05	2.3078	12 53 23.4	9.995
17	8 45 52.33	2.3015	12 43 21.9	10.056
18	8 48 10.23	2.2953	12 33 16.7	10.116
19	8 50 27.76	2.2889	12 23 8.0	10.173
20	8 52 44.90	2.2826	12 12 56.0	10.229
21	8 55 1.67	2.2764	12 2 40.5	10.285
22	8 57 18.07	2.2702	11 52 21.8	10.338
23	8 59 34.09	2.2640	11 42 0.0	10.390
24	9 1 49.75	2.2579	+11 31 35.0	−10.441

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 11.					DECEMBER 13.			
	h m . s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 1 49.75	2.2579	+11 31 35.0	−10.441	0	10 44 9.07	2.0283	+2 35 44.1	−11.463
1	9 4 5.04	2.2518	11 21 7.1	10.490	1	10 46 10.67	2.0249	2 24 16.4	11.459
2	9 6 19.97	2.2458	11 10 36.2	10.538	2	10 48 12.06	2.0218	2 12 49.0	11.454
3	9 8 34.54	2.2399	11 0 2.6	10.584	3	10 50 13.28	2.0187	2 1 21.9	11.450
4	9 10 48.76	2.2340	10 49 26.1	10.630	4	10 52 14.30	2.0155	1 49 55.0	11.444
5	9 13 2.62	2.2280	10 38 47.0	10.673	5	10 54 15.14	2.0125	1 38 28.6	11.436
6	9 15 16.12	2.2222	10 28 5.3	10.716	6	10 56 15.80	2.0096	1 27 2.6	11.429
7	9 17 29.28	2.2163	10 17 21.1	10.758	7	10 58 16.29	2.0067	1 15 37.1	11.421
8	9 19 42.08	2.2106	10 6 34.4	10.798	8	11 0 16.60	2.0038	1 4 12.1	11.413
9	9 21 54.55	2.2049	9 55 45.4	10.836	9	11 2 16.75	2.0011	0 52 47.6	11.403
10	9 24 6.67	2.1993	9 44 54.1	10.873	10	11 4 16.73	1.9983	0 41 23.8	11.391
11	9 26 18.46	2.1937	9 34 0.6	10.910	11	11 6 16.55	1.9958	0 30 0.7	11.379
12	9 28 29.91	2.1881	9 23 4.9	10.945	12	11 8 16.22	1.9933	0 18 38.3	11.367
13	9 30 41.03	2.1827	9 12 7.2	10.978	13	11 10 15.74	1.9908	+0 7 16.7	11.354
14	9 32 51.83	2.1773	9 1 7.6	11.010	14	11 12 15.11	1.9883	−0 4 4.2	11.341
15	9 35 2.30	2.1718	8 50 6.0	11.042	15	11 14 14.33	1.9858	0 15 24.2	11.326
16	9 37 12.45	2.1665	8 39 2.6	11.072	16	11 16 13.41	1.9836	0 26 43.3	11.311
17	9 39 22.28	2.1613	8 27 57.4	11.100	17	11 18 12.36	1.9813	0 38 1.5	11.295
18	9 41 31.80	2.1560	8 16 50.6	11.128	18	11 20 11.17	1.9791	0 49 18.7	11.278
19	9 43 41.00	2.1508	8 5 42.1	11.154	19	11 22 9.85	1.9770	1 0 34.9	11.261
20	9 45 49.90	2.1458	7 54 32.1	11.179	20	11 24 8.41	1.9749	1 11 50.0	11.243
21	9 47 58.49	2.1407	7 43 20.6	11.203	21	11 26 6.84	1.9729	1 23 4.0	11.224
22	9 50 6.78	2.1358	7 32 7.7	11.227	22	11 28 5.16	1.9710	1 34 16.9	11.204
23	9 52 14.78	2.1308	+ 7 20 53.4	−11.248	23	11 30 3.36	1.9691	−1 45 28.5	−11.184
	DECEMBER 12.					DECEMBER 14.			
0	9 54 22.48	2.1259	+ 7 9 37.9	−11.268	0	11 32 1.45	1.9673	−1 56 39.0	−11.163
1	9 56 29.89	2.1212	6 58 21.2	11.288	1	11 33 59.43	1.9655	2 7 48.1	11.142
2	9 58 37.02	2.1165	6 47 3.3	11.308	2	11 35 57.31	1.9638	2 18 56.0	11.120
3	10 0 43.87	2.1118	6 35 44.3	11.325	3	11 37 55.09	1.9622	2 30 2.5	11.097
4	10 2 50.43	2.1071	6 24 24.3	11.341	4	11 39 52.77	1.9606	2 41 7.6	11.073
5	10 4 56.72	2.1026	6 13 3.4	11.356	5	11 41 50.36	1.9591	2 52 11.2	11.048
6	10 7 2.74	2.0982	6 1 41.6	11.371	6	11 43 47.86	1.9577	3 3 13.4	11.024
7	10 9 8.50	2.0937	5 50 18.9	11.384	7	11 45 45.28	1.9563	3 14 14.1	10.998
8	10 11 13.98	2.0893	5 38 55.5	11.396	8	11 47 42.61	1.9548	3 25 13.2	10.973
9	10 13 19.21	2.0851	5 27 31.4	11.408	9	11 49 39.86	1.9536	3 36 10.8	10.946
10	10 15 24.19	2.0808	5 16 6.6	11.418	10	11 51 37.04	1.9523	3 47 6.7	10.918
11	10 17 28.91	2.0766	5 4 41.2	11.428	11	11 53 34.14	1.9512	3 58 1.0	10.890
12	10 19 33.38	2.0725	4 53 15.3	11.435	12	11 55 31.18	1.9501	4 8 53.5	10.861
13	10 21 37.61	2.0685	4 41 49.0	11.443	13	11 57 28.15	1.9490	4 19 44.3	10.833
14	10 23 41.60	2.0645	4 30 22.2	11.449	14	11 59 25.06	1.9481	4 30 33.4	10.803
15	10 25 45.35	2.0605	4 18 55.1	11.455	15	12 1 21.92	1.9471	4 41 20.6	10.772
16	10 27 48.86	2.0567	4 7 27.6	11.459	16	12 3 18.71	1.9462	4 52 6.0	10.741
17	10 29 52.15	2.0529	3 56 0.0	11.463	17	12 5 15.46	1.9454	5 2 49.5	10.709
18	10 31 55.21	2.0492	3 44 32.1	11.466	18	12 7 12.16	1.9446	5 13 31.1	10.678
19	10 33 58.05	2.0456	3 33 4.1	11.467	19	12 9 8.81	1.9438	5 24 10.8	10.644
20	10 36 0.68	2.0420	3 21 36.1	11.468	20	12 11 5.42	1.9432	5 34 48.4	10.610
21	10 38 3.09	2.0383	3 10 8.0	11.468	21	12 13 1.99	1.9426	5 45 24.0	10.577
22	10 40 5.28	2.0349	2 58 39.9	11.467	22	12 14 58.53	1.9420	5 55 57.6	10.543
23	10 42 7.28	2.0316	2 47 12.0	11.465	23	12 16 55.03	1.9414	6 6 29.1	10.507
24	10 44 9.07	2.0283	+ 2 35 44.1	−11.463	24	12 18 51.50	1.9410	−6 16 58.4	−10.471

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 15.					DECEMBER 17.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 18 51.50	1.9410	− 6 16 58.4	−10.471	0	13 52 22.73	1.9711	−13 47 43.4	−8.103
1	12 20 47.95	1.9406	6 27 25.6	10.435	1	13 54 21.04	1.9726	13 55 47.8	8.042
2	12 22 44.37	1.9403	6 37 50.6	10.398	2	13 56 19.44	1.9740	14 3 48.4	7.978
3	12 24 40.78	1.9399	6 48 13.3	10.359	3	13 58 17.92	1.9756	14 11 45.2	7.914
4	12 26 37.16	1.9397	6 58 33.7	10.322	4	14 0 16.51	1.9772	14 19 38.1	7.851
5	12 28 33.54	1.9395	7 8 51.9	10.283	5	14 2 15.18	1.9787	14 27 27.3	7.788
6	12 30 29.90	1.9393	7 19 7.7	10.244	6	14 4 13.95	1.9803	14 35 12.6	7.722
7	12 32 26.25	1.9392	7 29 21.2	10.204	7	14 6 12.82	1.9820	14 42 53.9	7.656
8	12 34 22.60	1.9392	7 39 32.2	10.163	8	14 8 11.79	1.9836	14 50 31.3	7.591
9	12 36 18.95	1.9391	7 49 40.8	10.123	9	14 10 10.85	1.9853	14 58 4.8	7.525
10	12 38 15.29	1.9391	7 59 46.9	10.081	10	14 12 10.02	1.9870	15 5 34.3	7.458
11	12 40 11.64	1.9393	8 9 50.5	10.039	11	14 14 9.29	1.9887	15 12 59.7	7.390
12	12 42 8.00	1.9394	8 19 51.6	9.997	12	14 16 8.66	1.9904	15 20 21.1	7.323
13	12 44 4.37	1.9396	8 29 50.1	9.953	13	14 18 8.14	1.9921	15 27 38.4	7.253
14	12 46 0.75	1.9398	8 39 46.0	9.909	14	14 20 7.71	1.9938	15 34 51.5	7.184
15	12 47 57.15	1.9401	8 49 39.2	9.865	15	14 22 7.40	1.9957	15 42 0.5	7.115
16	12 49 53.56	1.9403	8 59 29.8	9.820	16	14 24 7.19	1.9974	15 49 5.3	7.045
17	12 51 49.99	1.9406	9 9 17.6	9.774	17	14 26 7.09	1.9993	15 56 5.9	6.975
18	12 53 46.45	1.9412	9 19 2.7	9.729	18	14 28 7.10	2.0010	16 3 2.3	6.904
19	12 55 42.93	1.9416	9 28 45.1	9.683	19	14 30 7.21	2.0028	16 9 54.4	6.833
20	12 57 39.44	1.9422	9 38 24.6	9.635	20	14 32 7.44	2.0047	16 16 42.2	6.761
21	12 59 35.99	1.9427	9 48 1.3	9.588	21	14 34 7.78	2.0065	16 23 25.7	6.688
22	13 1 32.56	1.9432	9 57 35.2	9.540	22	14 36 8.22	2.0083	16 30 4.8	6.615
23	13 3 29.17	1.9438	−10 7 6.1	− 9.491	23	14 38 8.78	2.0103	−16 36 39.5	−6.542
DECEMBER 16.					DECEMBER 18.				
0	13 5 25.82	1.9445	−10 16 34.1	− 9.442	0	14 40 9.45	2.0121	−16 43 9.8	−6.468
1	13 7 22.51	1.9452	10 25 59.1	9.393	1	14 42 10.23	2.0140	16 49 35.7	6.394
2	13 9 19.24	1.9459	10 35 21.2	9.343	2	14 44 11.13	2.0158	16 55 57.1	6.319
3	13 11 16.02	1.9468	10 44 40.2	9.292	3	14 46 12.13	2.0178	17 2 14.0	6.243
4	13 13 12.85	1.9476	10 53 56.2	9.240	4	14 48 13.26	2.0197	17 8 26.3	6.168
5	13 15 9.73	1.9484	11 3 9.0	9.188	5	14 50 14.49	2.0215	17 14 34.1	6.092
6	13 17 6.66	1.9493	11 12 18.8	9.136	6	14 52 15.84	2.0235	17 20 37.3	6.015
7	13 19 3.64	1.9502	11 21 25.3	9.083	7	14 54 17.31	2.0253	17 26 35.9	5.938
8	13 21 0.68	1.9512	11 30 28.7	9.030	8	14 56 18.88	2.0273	17 32 29.9	5.860
9	13 22 57.78	1.9523	11 39 28.9	8.976	9	14 58 20.58	2.0292	17 38 19.1	5.782
10	13 24 54.95	1.9533	11 48 25.8	8.922	10	15 0 22.38	2.0310	17 44 3.7	5.703
11	13 26 52.17	1.9543	11 57 19.5	8.867	11	15 2 24.30	2.0330	17 49 43.5	5.624
12	13 28 49.46	1.9554	12 6 9.8	8.811	12	15 4 26.34	2.0349	17 55 18.6	5.545
13	13 30 46.82	1.9566	12 14 56.8	8.755	13	15 6 28.49	2.0368	18 0 48.9	5.465
14	13 32 44.25	1.9577	12 23 40.4	8.698	14	15 8 30.75	2.0387	18 6 14.4	5.384
15	13 34 41.74	1.9588	12 32 20.5	8.640	15	15 10 33.13	2.0406	18 11 35.0	5.303
16	13 36 39.31	1.9602	12 40 57.2	8.583	16	15 12 35.62	2.0424	18 16 50.8	5.223
17	13 38 36.96	1.9614	12 49 30.5	8.526	17	15 14 38.22	2.0443	18 22 1.7	5.141
18	13 40 34.68	1.9628	12 58 0.3	8.467	18	15 16 40.93	2.0462	18 27 7.7	5.058
19	13 42 32.49	1.9641	13 6 26.5	8.407	19	15 18 43.76	2.0481	18 32 8.7	4.976
20	13 44 30.37	1.9653	13 14 49.1	8.348	20	15 20 46.70	2.0500	18 37 4.8	4.893
21	13 46 28.33	1.9668	13 23 8.2	8.288	21	15 22 49.76	2.0518	18 41 55.8	4.809
22	13 48 26.38	1.9682	13 31 23.6	8.227	22	15 24 52.92	2.0537	18 46 41.9	4.726
23	13 50 24.51	1.9696	13 39 35.4	8.165	23	15 26 56.20	2.0555	18 51 22.9	4.641
24	13 52 22.73	1.9711	−13 47 43.4	− 8.103	24	15 28 59.58	2.0573	−18 55 58.8	−4.55[illegible]

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 19.			
	h m s	s	° ′ ″	″
0	15 28 59.58	2.0573	−18 55 58.8	−4.557
1	15 31 3.07	2.0592	19 0 29.7	4.472
2	15 33 6.68	2.0610	19 4 55.4	4.386
3	15 35 10.39	2.0628	19 9 16.0	4.300
4	15 37 14.21	2.0645	19 13 31.4	4.213
5	15 39 18.13	2.0663	19 17 41.6	4.127
6	15 41 22.16	2.0680	19 21 46.6	4.039
7	15 43 26.29	2.0697	19 25 46.3	3.953
8	15 45 30.52	2.0714	19 29 40.9	3.865
9	15 47 34.86	2.0732	19 33 30.1	3.776
10	15 49 39.30	2.0748	19 37 14.0	3.688
11	15 51 43.84	2.0764	19 40 52.6	3.599
12	15 53 48.47	2.0780	19 44 25.9	3.510
13	15 55 53.20	2.0797	19 47 53.8	3.420
14	15 57 58.03	2.0813	19 51 16.3	3.330
15	16 0 2.96	2.0828	19 54 33.4	3.240
16	16 2 7.97	2.0843	19 57 45.1	3.149
17	16 4 13.08	2.0859	20 0 51.3	3.058
18	16 6 18.28	2.0874	20 3 52.1	2.968
19	16 8 23.57	2.0889	20 6 47.4	2.876
20	16 10 28.95	2.0904	20 9 37.2	2.783
21	16 12 34.42	2.0918	20 12 21.4	2.691
22	16 14 39.97	2.0932	20 15 0.1	2.598
23	16 16 45.60	2.0945	−20 17 33.2	−2.507
	DECEMBER 20.			
0	16 18 51.31	2.0958	−20 20 0.9	−2.414
1	16 20 57.10	2.0973	20 22 22.9	2.320
2	16 23 2.98	2.0986	20 24 39.3	2.227
3	16 25 8.93	2.0998	20 26 50.1	2.133
4	16 27 14.95	2.1010	20 28 55.2	2.038
5	16 29 21.05	2.1022	20 30 54.7	1.945
6	16 31 27.21	2.1033	20 32 48.6	1.850
7	16 33 33.45	2.1045	20 34 36.7	1.755
8	16 35 39.75	2.1056	20 36 19.2	1.660
9	16 37 46.12	2.1067	20 37 55.9	1.565
10	16 39 52.55	2.1077	20 39 27.0	1.470
11	16 41 59.04	2.1087	20 40 52.3	1.374
12	16 44 5.59	2.1097	20 42 11.9	1.279
13	16 46 12.20	2.1106	20 43 25.8	1.183
14	16 48 18.86	2.1115	20 44 33.8	1.086
15	16 50 25.58	2.1124	20 45 36.1	0.991
16	16 52 32.35	2.1132	20 46 32.7	0.894
17	16 54 39.16	2.1140	20 47 23.4	0.797
18	16 56 46.03	2.1148	20 48 8.3	0.701
19	16 58 52.93	2.1154	20 48 47.5	0.604
20	17 0 59.88	2.1162	20 49 20.8	0.507
21	17 3 6.87	2.1168	20 49 48.3	0.410
22	17 5 13.90	2.1174	20 50 10.0	0.313
23	17 7 20.96	2.1180	20 50 25.8	0.215
24	17 9 28.06	2.1186	−20 50 35.8	−0.118

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 21.			
	h m s	s	° ′ ″	″
0	17 9 28.06	2.1186	−20 50 35.8	−0.118
1	17 11 35.19	2.1191	20 50 39.9	−0.020
2	17 13 42.35	2.1196	20 50 38.2	+0.077
3	17 15 49.54	2.1200	20 50 30.7	0.174
4	17 17 56.75	2.1203	20 50 17.3	0.273
5	17 20 3.98	2.1208	20 49 58.0	0.370
6	17 22 11.24	2.1211	20 49 32.9	0.468
7	17 24 18.51	2.1213	20 49 1.9	0.566
8	17 26 25.80	2.1216	20 48 25.0	0.663
9	17 28 33.10	2.1218	20 47 42.3	0.761
10	17 30 40.41	2.1219	20 46 53.7	0.858
11	17 32 47.73	2.1221	20 45 59.3	0.956
12	17 34 55.06	2.1222	20 44 59.0	1.054
13	17 37 2.39	2.1223	20 43 52.8	1.152
14	17 39 9.73	2.1223	20 42 40.8	1.248
15	17 41 17.07	2.1223	20 41 23.0	1.347
16	17 43 24.40	2.1222	20 39 59.2	1.444
17	17 45 31.73	2.1222	20 38 29.7	1.541
18	17 47 39.06	2.1220	20 36 54.3	1.639
19	17 49 46.37	2.1218	20 35 13.0	1.736
20	17 51 53.67	2.1216	20 33 26.0	1.833
21	17 54 0.96	2.1214	20 31 33.1	1.930
22	17 56 8.24	2.1211	20 29 34.4	2.028
23	17 58 15.49	2.1208	−20 27 29.8	+2.124
	DECEMBER 22.			
0	18 0 22.73	2.1205	−20 25 19.5	+2.220
1	18 2 29.95	2.1201	20 23 3.4	2.318
2	18 4 37.14	2.1196	20 20 41.4	2.414
3	18 6 44.30	2.1192	20 18 13.7	2.509
4	18 8 51.44	2.1187	20 15 40.3	2.606
5	18 10 58.54	2.1181	20 13 1.0	2.703
6	18 13 5.61	2.1176	20 10 16.0	2.798
7	18 15 12.65	2.1171	20 7 25.3	2.893
8	18 17 19.66	2.1164	20 4 28.9	2.988
9	18 19 26.62	2.1158	20 1 26.7	3.083
10	18 21 33.55	2.1151	19 58 18.9	3.178
11	18 23 40.43	2.1143	19 55 5.3	3.273
12	18 25 47.27	2.1137	19 51 46.1	3.368
13	18 27 54.07	2.1128	19 48 21.2	3.462
14	18 30 0.81	2.1120	19 44 50.7	3.555
15	18 32 7.51	2.1113	19 41 14.6	3.649
16	18 34 14.16	2.1103	19 37 32.8	3.743
17	18 36 20.75	2.1094	19 33 45.5	3.835
18	18 38 27.29	2.1085	19 29 52.6	3.928
19	18 40 33.77	2.1076	19 25 54.1	4.022
20	18 42 40.20	2.1067	19 21 50.0	4.113
21	18 44 46.57	2.1056	19 17 40.5	4.205
22	18 46 52.87	2.1046	19 13 25.4	4.298
23	18 48 59.12	2.1036	19 9 4.8	4.388
24	18 51 5.30	2.1025	−19 4 38.8	+4.479

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 23.			
	h m s	s	° ′ ″	″
0	18 51 5.30	2.1025	−19 4 38.8	+4.479
1	18 53 11.42	2.1014	19 0 7.3	4.570
2	18 55 17.47	2.1003	18 55 30.4	4.660
3	18 57 23.45	2.0991	18 50 48.1	4.750
4	18 59 29.36	2.0980	18 46 0.4	4.840
5	19 1 35.21	2.0968	18 41 7.3	4.929
6	19 3 40.98	2.0956	18 36 8.9	5.018
7	19 5 46.68	2.0943	18 31 5.2	5.106
8	19 7 52.30	2.0931	18 25 56.2	5.194
9	19 9 57.85	2.0918	18 20 41.9	5.282
10	19 12 3.32	2.0906	18 15 22.4	5.368
11	19 14 8.72	2.0893	18 9 57.7	5.456
12	19 16 14.04	2.0880	18 4 27.7	5.543
13	19 18 19.28	2.0867	17 58 52.6	5.628
14	19 20 24.44	2.0854	17 53 12.3	5.714
15	19 22 29.53	2.0841	17 47 26.9	5.799
16	19 24 34.53	2.0827	17 41 36.4	5.883
17	19 26 39.45	2.0813	17 35 40.9	5.968
18	19 28 44.28	2.0799	17 29 40.3	6.053
19	19 30 49.04	2.0786	17 23 34.6	6.136
20	19 32 53.71	2.0771	17 17 24.0	6.218
21	19 34 58.29	2.0757	17 11 8.5	6.300
22	19 37 2.79	2.0743	17 4 48.0	6.383
23	19 39 7.21	2.0729	−16 58 22.6	+6.464
	DECEMBER 24.			
0	19 41 11.54	2.0715	−16 51 52.3	+6.545
1	19 43 15.79	2.0701	16 45 17.2	6.626
2	19 45 19.95	2.0686	16 38 37.2	6.706
3	19 47 24.02	2.0672	16 31 52.5	6.785
4	19 49 28.01	2.0658	16 25 3.0	6.864
5	19 51 31.92	2.0643	16 18 8.8	6.943
6	19 53 35.73	2.0628	16 11 9.9	7.020
7	19 55 39.46	2.0615	16 4 6.4	7.098
8	19 57 43.11	2.0600	15 56 58.2	7.175
9	19 59 46.66	2.0586	15 49 45.4	7.251
10	20 1 50.14	2.0572	15 42 28.1	7.327
11	20 3 53.52	2.0557	15 35 6.2	7.403
12	20 5 56.82	2.0543	15 27 39.8	7.477
13	20 8 0.03	2.0528	15 20 9.0	7.551
14	20 10 3.16	2.0515	15 12 33.7	7.625
15	20 12 6.21	2.0501	15 4 54.0	7.698
16	20 14 9.17	2.0487	14 57 9.9	7.771
17	20 16 12.05	2.0473	14 49 21.5	7.843
18	20 18 14.84	2.0458	14 41 28.8	7.913
19	20 20 17.55	2.0445	14 33 31.9	7.984
20	20 22 20.18	2.0431	14 25 30.7	8.056
21	20 24 22.72	2.0418	14 17 25.2	8.125
22	20 26 25.19	2.0404	14 9 15.7	8.193
23	20 28 27.57	2.0391	14 1 2.0	8.263
24	20 30 29.88	2.0378	−13 52 44.2	+8.330

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 25.			
	h m s	s	° ′ ″	″
0	20 30 29.88	2.0378	−13 52 44.2	+ 8.330
1	20 32 32.11	2.0365	13 44 22.4	8.398
2	20 34 34.26	2.0353	13 35 56.5	8.465
3	20 36 36.34	2.0339	13 27 26.6	8.531
4	20 38 38.33	2.0327	13 18 52.8	8.596
5	20 40 40.26	2.0315	13 10 15.1	8.662
6	20 42 42.11	2.0303	13 1 33.4	8.726
7	20 44 43.89	2.0291	12 52 48.0	8.789
8	20 46 45.60	2.0279	12 43 58.7	8.853
9	20 48 47.24	2.0268	12 35 5.6	8.916
10	20 50 48.81	2.0257	12 26 8.8	8.977
11	20 52 50.32	2.0246	12 17 8.4	9.038
12	20 54 51.76	2.0235	12 8 4.2	9.099
13	20 56 53.14	2.0224	11 58 56.5	9.159
14	20 58 54.45	2.0213	11 49 45.1	9.219
15	21 0 55.70	2.0203	11 40 30.2	9.278
16	21 2 56.89	2.0194	11 31 11.8	9.336
17	21 4 58.03	2.0185	11 21 49.9	9.393
18	21 6 59.11	2.0175	11 12 24.6	9.450
19	21 9 0.13	2.0167	11 2 55.9	9.506
20	21 11 1.11	2.0158	10 53 23.9	9.562
21	21 13 2.03	2.0149	10 43 48.5	9.618
22	21 15 2.90	2.0142	10 34 9.8	9.672
23	21 17 3.73	2.0134	−10 24 27.9	+ 9.725
	DECEMBER 26.			
0	21 19 4.51	2.0127	−10 14 42.8	+ 9.778
1	21 21 5.25	2.0119	10 4 54.5	9.830
2	21 23 5.94	2.0113	9 55 3.2	9.882
3	21 25 6.60	2.0107	9 45 8.7	9.933
4	21 27 7.22	2.0100	9 35 11.2	9.983
5	21 29 7.80	2.0094	9 25 10.7	10.033
6	21 31 8.35	2.0089	9 15 7.2	10.083
7	21 33 8.87	2.0084	9 5 0.8	10.131
8	21 35 9.36	2.0079	8 54 51.5	10.179
9	21 37 9.82	2.0075	8 44 39.3	10.226
10	21 39 10.26	2.0072	8 34 24.4	10.272
11	21 41 10.68	2.0068	8 24 6.7	10.318
12	21 43 11.08	2.0065	8 13 46.3	10.363
13	21 45 11.46	2.0063	8 3 23.2	10.407
14	21 47 11.83	2.0060	7 52 57.5	10.450
15	21 49 12.18	2.0058	7 42 29.2	10.493
16	21 51 12.53	2.0057	7 31 58.3	10.536
17	21 53 12.86	2.0056	7 21 24.9	10.578
18	21 55 13.20	2.0056	7 10 49.0	10.618
19	21 57 13.53	2.0055	7 0 10.7	10.658
20	21 59 13.86	2.0055	6 49 30.0	10.698
21	22 1 14.19	2.0056	6 38 47.0	10.737
22	22 3 14.53	2.0058	6 28 1.6	10.775
23	22 5 14.88	2.0059	6 17 14.0	10.812
24	22 7 15.24	2.0062	− 6 6 24.2	+10.848

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 27.					DECEMBER 29.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 7 15.24	2.0062	−6 6 24.2	+10.848	0	23 44 46.96	2.0792	+ 3 2 9.9	+11.696
1	22 9 15.62	2.0064	5 55 32.2	10.884	1	23 46 51.80	2.0821	3 13 51.6	11.693
2	22 11 16.01	2.0068	5 44 38.1	10.920	2	23 48 56.81	2.0851	3 25 33.0	11.688
3	22 13 16.43	2.0071	5 33 41.8	10.955	3	23 51 2.01	2.0882	3 37 14.2	11.684
4	22 15 16.86	2.0074	5 22 43.5	10.988	4	23 53 7.39	2.0913	3 48 55.1	11.678
5	22 17 17.32	2.0079	5 11 43.2	11.021	5	23 55 12.96	2.0944	4 0 35.5	11.670
6	22 19 17.81	2.0085	5 0 41.0	11.053	6	23 57 18.72	2.0978	4 12 15.5	11.662
7	22 21 18.34	2.0091	4 49 36.8	11.085	7	23 59 24.69	2.1011	4 23 54.9	11.653
8	22 23 18.90	2.0096	4 38 30.8	11.116	8	0 1 30.85	2.1044	4 35 33.8	11.643
9	22 25 19.49	2.0103	4 27 22.9	11.146	9	0 3 37.22	2.1078	4 47 12.0	11.632
10	22 27 20.13	2.0110	4 16 13.3	11.175	10	0 5 43.79	2.1113	4 58 49.6	11.620
11	22 29 20.81	2.0117	4 5 1.9	11.204	11	0 7 50.58	2.1149	5 10 26.4	11.606
12	22 31 21.53	2.0125	3 53 48.8	11.232	12	0 9 57.58	2.1185	5 22 2.3	11.592
13	22 33 22.31	2.0133	3 42 34.1	11.259	13	0 12 4.80	2.1223	5 33 37.4	11.577
14	22 35 23.13	2.0143	3 31 17.7	11.286	14	0 14 12.25	2.1259	5 45 11.5	11.560
15	22 37 24.02	2.0153	3 19 59.8	11.311	15	0 16 19.91	2.1297	5 56 44.6	11.543
16	22 39 24.97	2.0163	3 8 40.4	11.335	16	0 18 27.81	2.1336	6 8 16.6	11.524
17	22 41 25.97	2.0173	2 57 19.6	11.359	17	0 20 35.94	2.1375	6 19 47.5	11.505
18	22 43 27.05	2.0185	2 45 57.3	11.383	18	0 22 44.31	2.1415	6 31 17.2	11.484
19	22 45 28.19	2.0197	2 34 33.6	11.406	19	0 24 52.92	2.1455	6 42 45.6	11.463
20	22 47 29.41	2.0210	2 23 8.6	11.428	20	0 27 1.77	2.1496	6 54 12.7	11.440
21	22 49 30.71	2.0223	2 11 42.3	11.448	21	0 29 10.87	2.1538	7 5 38.4	11.416
22	22 51 32.08	2.0236	2 0 14.8	11.468	22	0 31 20.22	2.1579	7 17 2.6	11.391
23	22 53 33.54	2.0250	−1 48 46.1	+11.488	23	0 33 29.82	2.1622	+ 7 28 25.3	+11.364
DECEMBER 28.					DECEMBER 30.				
0	22 55 35.08	2.0264	−1 37 16.3	+11.506	0	0 35 39.68	2.1665	+ 7 39 46.3	+11.336
1	22 57 36.71	2.0280	1 25 45.4	11.523	1	0 37 49.80	2.1709	7 51 5.7	11.308
2	22 59 38.44	2.0296	1 14 13.5	11.541	2	0 40 0.19	2.1753	8 2 23.3	11.278
3	23 1 40.26	2.0312	1 2 40.5	11.557	3	0 42 10.84	2.1798	8 13 39.1	11.248
4	23 3 42.18	2.0328	0 51 6.7	11.572	4	0 44 21.76	2.1843	8 24 53.1	11.217
5	23 5 44.20	2.0346	0 39 31.9	11.587	5	0 46 32.96	2.1889	8 36 5.1	11.183
6	23 7 46.33	2.0364	0 27 56.3	11.600	6	0 48 44.43	2.1936	8 47 15.0	11.148
7	23 9 48.57	2.0383	0 16 19.9	11.613	7	0 50 56.19	2.1983	8 58 22.9	11.113
8	23 11 50.93	2.0403	−0 4 42.7	11.625	8	0 53 8.22	2.2030	9 9 28.6	11.076
9	23 13 53.40	2.0422	+0 6 55.1	11.636	9	0 55 20.55	2.2078	9 20 32.0	11.038
10	23 15 55.99	2.0443	0 18 33.6	11.646	10	0 57 33.16	2.2127	9 31 33.2	10.999
11	23 17 58.71	2.0463	0 30 12.6	11.655	11	0 59 46.07	2.2176	9 42 31.9	10.958
12	23 20 1.55	2.0485	0 41 52.2	11.664	12	1 1 59.27	2.2225	9 53 28.2	10.917
13	23 22 4.53	2.0508	0 53 32.3	11.672	13	1 4 12.77	2.2275	10 4 22.0	10.874
14	23 24 7.64	2.0529	1 5 12.8	11.678	14	1 6 26.57	2.2326	10 15 13.1	10.829
15	23 26 10.88	2.0553	1 16 53.7	11.684	15	1 8 40.68	2.2377	10 26 1.5	10.784
16	23 28 14.27	2.0578	1 28 34.9	11.689	16	1 10 55.09	2.2428	10 36 47.2	10.738
17	23 30 17.81	2.0603	1 40 16.4	11.693	17	1 13 9.82	2.2480	10 47 30.1	10.690
18	23 32 21.50	2.0628	1 51 58.1	11.697	18	1 15 24.85	2.2532	10 58 10.0	10.640
19	23 34 25.34	2.0653	2 3 40.0	11.699	19	1 17 40.20	2.2585	11 8 46.9	10.589
20	23 36 29.33	2.0679	2 15 22.0	11.701	20	1 19 55.87	2.2638	11 19 20.7	10.538
21	23 38 33.49	2.0707	2 27 4.1	11.701	21	1 22 11.86	2.2692	11 29 51.4	10.485
22	23 40 37.81	2.0734	2 38 46.1	11.700	22	1 24 28.17	2.2746	11 40 18.9	10.430
23	23 42 42.30	2.0763	2 50 28.1	11.698	23	1 26 44.81	2.2800	11 50 43.0	10.374
24	*23 44 46.96*	*2.0792*	*+3 2 9.9*	+11.696	24	1 29 1.77	2.2854	+12 1 3.8	+10.318

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 31.					DECEMBER 31.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 29 1.77	2.2854	+12 1 3.8	+10.318	12	1 56 51.55	2.3534	+14 0 18.3	+9.523
1	1 31 19.06	2.2910	12 11 21.1	10.258	13	1 59 12.93	2.3593	14 9 47.4	9.448
2	1 33 36.69	2.2965	12 21 34.8	10.198	14	2 1 34.67	2.3653	14 19 12.0	9.371
3	1 35 54.64	2.3021	12 31 44.9	10.138	15	2 3 56.76	2.3710	14 28 31.9	9.293
4	1 38 12.94	2.3077	12 41 51.3	10.074	16	2 6 19.19	2.3768	14 37 47.1	9.213
5	1 40 31.56	2.3133	12 51 53.8	10.010	17	2 8 41.98	2.3828	14 46 57.5	9.132
6	1 42 50.53	2.3190	13 1 52.5	9.945	18	2 11 5.13	2.3888	14 56 2.9	9.049
7	1 45 9.84	2.3247	13 11 47.2	9.878	19	2 13 28.63	2.3946	15 5 3.4	8.966
8	1 47 29.49	2.3304	13 21 37.9	9.810	20	2 15 52.48	2.4004	15 13 58.8	8.880
9	1 49 49.49	2.3362	13 31 24.4	9.740	21	2 18 16.68	2.4063	15 22 49.0	8.793
10	1 52 9.83	2.3419	13 41 6.7	9.669	22	2 20 41.24	2.4123	15 31 34.0	8.705
11	1 54 30.52	2.3477	13 50 44.7	9.597	23	2 23 6.16	2.4183	15 40 13.6	8.615
12	1 56 51.55	2.3534	+14 0 18.3	+ 9.523	24	2 25 31.43	2.4241	+15 48 47.8	+8.524

PHASES OF THE MOON.

		d h m		d h m		d h m		d h m
● New Moon	Jan.	1 20 24.1	Mar.	31 9 4.9	June	27 8 52.6	Sept.	23 16 33.9
☽ First Quarter		8 22 55.2	Apr.	7 0 38.8	July	4 15 17.2	Oct.	1 20 37.3
○ Full Moon		15 20 44.4		14 20 25.1		12 18 2.2		9 1 38.6
☾ Last Quarter		23 16 22.0		22 23 21.1		19 23 3.0		15 17 4.7
● New Moon		31 11 7.0		29 17 30.4		26 17 21.4		23 8 39.5
☽ First Quarter	Feb.	7 6 52.3	May	6 11 33.9	Aug.	3 8 11.5		31 13 43.2
○ Full Moon		14 11 38.2		14 13 1.3		11 5 39.5	Nov.	7 11 35.2
☾ Last Quarter		22 13 47.7		22 10 3.9		18 3 56.1		14 3 40.5
● New Moon	Mar.	1 23 11.4		29 1 11.9		25 3 37.1		22 3 19.7
☽ First Quarter		8 15 14.1	June	5 0 21.9	Sept.	2 2 21.9		30 4 46.9
○ Full Moon		16 3 41.1		13 4 28.2		9 15 54.3	Dec.	6 22 3.5
☾ Last Quarter		24 8 33.9		20 17 32.9		16 9 31.7		13 18 2.4
● New Moon		31 9 4.9		27 8 52.6		23 16 33.9		21 22 55.2
☽ First Quarter	Apr.	7 0 38.8	July	4 15 17.2	Oct.	1 20 37.3		29 17 25.0

APOGEE.

	d h		d h
January	23 11.4	August	4 3.3
February	20 7.9	August	31 22.3
March	20 0.6	September	28 17.5
April	16 8.5	October	26 8.7
May	13 10.2	November	22 14.4
June	9 18.5	December	19 15.6
July	7 9.4		

PERIGEE.

	d h		d h
January	10 22.2	July	23 2.4
February	4 14.9	August	17 17.0
March	4 2.7	September	12 20.1
April	1 9.0	October	10 16.9
April	29 19.3	November	8 1.9
May	28 5.4	December	6 14.7
June	25 10.4		

MOON, 1919.

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ′ ″	° ′ ″	′ ″	′ ″	″	d				h m	m
Jan.	1.0	269 59 2.0	+1 32 4.0	15 17.9	56 2.73	+1.361	28.9	Jan.	1	L	11 44.5	2.20
	1.5	276 22 53.5	2 4 58.1	15 22.3	56 19.11	1.366	29.4				. . . . .	. . .
	2.0	282 50 48.7	2 36 34.8	15 26.8	56 35.45	1.353	0.2		2	U	0 10.9	2.19
	2.5	289 22 44.9	3 6 26.3	15 31.2	56 51.51	1.321	0.7		2	L	12 37.1	2.17
	3.0	295 58 35.6	3 34 4.8	15 35.4	57 7.11	1.277	1.2		3	U	1 3.0	2.15
	3.5	302 38 11.0	+3 59 3.1	15 39.5	57 22.11	+1.221	1.7		3	L	13 28.7	2.13
	4.0	309 21 18.4	4 20 55.8	15 43.4	57 36.37	1.155	2.2		4	U	1 54.1	2.10
	4.5	316 7 42.7	4 39 19.2	15 47.0	57 49.80	1.083	2.7		4	L	14 19.2	2.08
	5.0	322 57 7.5	4 53 52.5	15 50.5	58 2.35	1.008	3.2		5	U	2 44.0	2.06
	5.5	329 49 15.2	5 4 18.4	15 53.6	58 13.98	0.932	3.7		5	L	15 8.6	2.04
	6.0	336 43 48.2	+5 10 22.9	15 56.6	58 24.72	+0.858	4.2		6*	U	3 33.1	2.04
	6.5	343 40 29.2	5 11 56.7	15 59.2	58 34.57	0.784	4.7		6	L	15 57.6	2.04
	7.0	350 39 1.4	5 8 54.7	16 1.7	58 43.53	0.709	5.2		7	U	4 22.2	2.06
	7.5	357 39 9.6	5 1 16.4	16 3.9	58 51.59	0.636	5.7		7	L	16 47.0	2.08
	8.0	4 40 39.5	4 49 5.9	16 5.8	58 58.79	0.563	6.2		8	U	5 12.1	2.11
	8.5	11 43 18.3	+4 32 32.0	16 7.6	59 5.09	+0.485	6.7		8	L	17 37.6	2.15
	9.0	18 46 53.6	4 11 48.1	16 9.0	59 10.42	0.403	7.2		9	U	6 3.7	2.20
	9.5	25 51 14.1	3 47 11.7	16 10.2	59 14.73	0.314	7.7		9	L	18 30.4	2.25
	10.0	32 56 8.7	3 19 4.9	16 11.1	59 17.92	0.215	8.2		10	U	6 57.7	2.30
	10.5	40 1 25.8	2 47 53.4	16 11.6	59 19.84	+0.104	8.7		10	L	19 25.7	2.36
	11.0	47 6 52.6	+2 14 6.4	16 11.7	59 20.36	−0.020	9.2		11	U	7 54.3	2.41
	11.5	54 12 15.0	1 38 16.4	16 11.4	59 19.32	0.155	9.7		11	L	20 23.5	2.45
	12.0	61 17 17.0	1 0 58.3	16 10.7	59 16.58	0.304	10.2		12	U	8 53.1	2.48
	12.5	68 21 40.3	+0 22 48.7	16 9.4	59 11.98	0.463	10.7		12	L	21 22.9	2.49
	13.0	75 25 4.1	−0 15 34.7	16 7.7	59 5.45	0.628	11.2		13	U	9 52.7	2.47
	13.5	82 27 5.5	−0 53 34.1	16 5.3	58 56.90	−0.797	11.7		13	L	22 22.2	2.44
	14.0	89 27 19.5	1 30 32.7	16 2.4	58 46.33	0.965	12.2		14	U	10 51.3	2.40
	14.5	96 25 20.0	2 5 55.5	15 59.0	58 33.77	1.126	12.7		14	L	23 19.8	2.34
	15.0	103 20 40.4	2 39 10.3	15 55.1	58 19.36	1.274	13.2		15	U	11 47.5	2.28
	15.5	110 12 54.4	3 9 48.3	15 50.7	58 3.26	1.405	13.7				. . . . .	. . .
	16.0	117 1 37.2	−3 37 25.0	15 45.9	57 45.73	−1.514	14.2		16	L	0 14.4	2.21
	16.5	123 46 26.1	4 1 40.6	15 40.8	57 27.03	1.598	14.7		16	U	12 40.4	2.13
	17.0	130 27 2.6	4 22 19.9	15 35.5	57 7.50	1.652	15.2		17	L	1 5.5	2.06
	17.5	137 3 11.7	4 39 12.6	15 30.1	56 47.50	1.675	15.7		17	U	13 29.8	1.99
	18.0	143 34 43.7	4 52 12.7	15 24.6	56 27.42	1.667	16.2		18	L	1 53.3	1.93
	18.5	150 1 34.3	−5 1 18.4	15 19.2	56 7.61	−1.628	16.7		18	U	14 16.2	1.88
	19.0	156 23 44.5	5 6 31.4	15 14.0	55 48.46	1.559	17.2		19	L	2 38.5	1.84
	19.5	162 41 21.4	5 7 56.3	15 9.0	55 30.32	1.460	17.7		19	U	15 0.3	1.80
	20.0	168 54 37.3	5 5 40.4	15 4.5	55 13.53	1.335	18.2		20	L	3 21.8	1.78
	20.5	175 3 49.6	4 59 52.5	15 0.3	54 58.36	1.188	18.7		20	U	15 43.1	1.77
	21.0	181 9 20.9	−4 50 42.8	14 56.7	54 45.09	−1.021	19.2		21	L	4 4.3	1.76
	21.5	187 11 37.8	4 38 22.6	14 53.7	54 33.93	0.836	19.7		21	U	16 25.4	1.76
	22.0	193 11 10.4	4 23 3.7	14 51.3	54 25.09	0.635	20.2		22	L	4 46.7	1.78
	22.5	199 8 32.4	4 4 58.3	14 49.5	54 18.72	0.426	20.7		22	U	17 8.2	1.80
	23.0	205 4 19.8	3 44 19.0	14 48.5	54 14.90	−0.210	21.2		23	L	5 29.9	1.83
	23.5	210 59 10.5	−3 21 18.3	14 48.2	54 13.71	+0.012	21.7		23	U	17 52.1	1.86
	24.0	216 53 43.9	−2 56 9.4	14 48.6	54 15.20	+0.235	22.2		24	L	6 14.6	1.90

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ′ ″	° ′ ″	′ ″	′ ″	″	d				h m	m
an.	24.0	216 53 43.9	−2 56 9.4	14 48.6	54 15.20	+0.235	22.2	Jan.	24	L	6 14.6	1.90
	24.5	222 48 40.5	2 29 5.5	14 49.7	54 19.33	0.454	22.7		24	U	18 37.7	1.95
	25.0	228 44 40.4	2 0 20.4	14 51.5	54 26.08	0.668	23.2		25	L	7 1.3	1.99
	25.5	234 42 23.8	1 30 9.1	14 54.0	54 35.32	0.872	23.7		25	U	19 25.4	2.03
	26.0	240 42 29.6	0 58 47.0	14 57.2	54 46.96	1.065	24.2		26	L	7 50.1	2.08
	26.5	246 45 35.6	−0 26 31.0	15 1.0	55 0.81	+1.240	24.7		26	U	20 15.2	2.12
	27.0	252 52 16.4	+0 6 20.4	15 5.3	55 16.65	1.396	25.2		27	L	8 40.9	2.15
	27.5	259 3 4.0	0 39 27.4	15 10.1	55 34.22	1.528	25.7		27	U	21 6.8	2.18
	28.0	265 18 26.2	1 12 27.8	15 15.3	55 53.21	1.633	26.2		28	L	9 33.1	2.20
	28.5	271 38 45.9	1 44 58.1	15 20.7	56 13.30	1.710	26.7		28	U	21 59.5	2.21
	29.0	278 4 20.8	+2 16 32.6	15 26.4	56 34.12	+1.754	27.2		29	L	10 26.0	2.21
	29.5	284 35 21.8	2 46 44.3	15 32.2	56 55.27	1.765	27.7		29	U	22 52.5	2.20
	30.0	291 11 52.8	3 15 4.7	15 37.9	57 16.34	1.742	28.2		30	L	11 18.8	2.18
	30.5	297 53 50.6	3 41 5.1	15 43.5	57 36.94	1.684	28.7		30	U	23 44.9	2.17
	31.0	304 41 3.9	4 4 16.6	15 48.9	57 56.63	1.593	29.2				. . . . .	. . .
	31.5	311 33 13.8	+4 24 11.6	15 53.9	58 15.06	+1.473	0.0		31	L	12 10.8	2.15
eb.	1.0	318 29 54.5	4 40 24.6	15 58.5	58 31.88	1.327	0.5	Feb.	1	U	0 36.5	2.14
	1.5	325 30 33.9	4 52 33.4	16 2.6	58 46.82	1.159	1.0		1	L	13 2.1	2.12
	2.0	332 34 34.5	5 0 19.7	16 6.1	58 59.64	0.977	1.5		2	U	1 27.4	2.11
	2.5	339 41 15.8	5 3 30.3	16 9.0	59 10.22	0.785	2.0		2	L	13 52.7	2.10
	3.0	346 49 54.9	+5 1 57.8	16 11.2	59 18.46	+0.589	2.5		3	U	2 17.9	2.11
	3.5	353 59 49.6	4 55 40.7	16 12.8	59 24.38	0.399	3.0		3	L	14 43.3	2.12
	4.0	1 10 19.0	4 44 43.7	16 13.8	59 28.06	0.215	3.5		4	U	3 8.8	2.14
	4.5	8 20 45.5	4 29 17.4	16 14.2	59 29.59	+0.042	4.0		4	L	15 34.6	2.17
	5.0	15 30 36.2	4 9 37.8	16 14.1	59 29.14	−0.114	4.5		5	U	4 0.8	2.19
	5.5	22 39 23.3	+3 46 5.7	16 13.5	59 26.92	−0.254	5.0		5	L	16 27.3	2.23
	6.0	29 46 44.6	3 19 6.3	16 12.5	59 23.10	0.378	5.5		6	U	4 54.4	2.28
	6.5	36 52 23.3	2 49 7.7	16 11.1	59 17.91	0.486	6.0		6	L	17 22.0	2.32
	7.0	43 56 7.9	2 16 40.7	16 9.3	59 11.50	0.579	6.5		7	U	5 50.0	2.36
	7.5	50 57 50.9	1 42 17.8	16 7.3	59 4.07	0.658	7.0		7	L	18 18.5	2.38
	8.0	57 57 28.7	+1 6 32.4	16 5.0	58 55.75	−0.729	7.5		8	U	6 47.2	2.40
	8.5	64 54 59.7	+0 29 58.6	16 2.5	58 46.60	0.794	8.0		8	L	19 16.2	2.42
	9.0	71 50 23.6	−0 6 49.9	15 59.8	58 36.73	0.851	8.5		9	U	7 45.3	2.42
	9.5	78 43 40.8	0 43 19.6	15 57.0	58 26.18	0.907	9.0		9	L	20 14.2	2.40
	10.0	85 34 50.9	1 18 58.4	15 53.9	58 14.97	0.961	9.5		10	U	8 42.8	2.37
	10.5	92 23 52.2	−1 53 15.9	15 50.7	58 3.13	−1.013	10.0		10	L	21 11.0	2.32
	11.0	99 10 41.8	2 25 43.2	15 47.3	57 50.66	1.065	10.5		11	U	9 38.5	2.27
	11.5	105 55 14.5	2 55 54.3	15 43.7	57 37.57	1.115	11.0		11	L	22 5.4	2.21
	12.0	112 37 23.0	3 23 25.5	15 40.0	57 23.90	1.164	11.5		12	U	10 31.5	2.15
	12.5	119 16 58.4	3 47 56.7	15 36.1	57 9.65	1.207	12.0		12	L	22 56.9	2.08
	13.0	125 53 50.6	−4 9 11.0	15 32.1	56 54.95	−1.244	12.5		13	U	11 21.5	2.02
	13.5	132 27 49.0	4 26 55.1	15 28.0	56 39.83	1.271	13.0		13	L	23 45.4	1.97
	14.0	138 58 42.2	4 40 59.7	15 23.8	56 24.48	1.288	13.5				. . . . .	. . .
	14.5	145 26 20.8	4 51 18.7	15 19.6	56 8.98	1.291	14.0		14	U	12 8.7	1.92
	15.0	151 50 36.1	4 57 50.2	15 15.4	55 53.56	1.277	14.5		15	L	0 31.5	1.87
	15.5	158 11 22.4	−5 0 35.2	15 11.2	55 38.40	−1.246	15.0		15	U	12 53.7	1.83
	16.0	164 28 36.8	−4 59 38.0	15 7.2	55 23.73	−1.196	15.5		16	L	1 15.6	1.82

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Feb. 16.0	164 28 36.8	−4 59 38.0	15 7.2	55 23.73	−1.196	15.5	Feb. 16	L	1 15.6	1.82
16.5	170 42 20.0	4 55 5.2	15 3.4	55 9.77	1.128	16.0	16	U	13 37.3	1.79
17.0	176 52 36.8	4 47 6.0	14 59.9	54 56.73	1.040	16.5	17	L	1 58.7	1.78
17.5	182 59 36.4	4 35 51.2	14 56.6	54 44.90	0.931	17.0	17	U	14 20.1	1.78
18.0	189 3 31.8	4 21 33.0	14 53.8	54 34.47	0.804	17.5	18	L	2 41.4	1.78
18.5	195 4 41.2	−4 4 24.4	14 51.4	54 25.68	−0.659	18.0	18	U	15 2.9	1.79
19.0	201 3 26.1	3 44 39.5	14 49.5	54 18.72	0.498	18.5	19	L	3 24.5	1.81
19.5	207 0 12.7	3 22 32.5	14 48.2	54 13.80	0.320	19.0	19	U	15 46.4	1.84
20.0	212 55 30.2	2 58 18.0	14 47.4	54 11.08	−0.131	19.5	20	L	4 8.6	1.87
20.5	218 49 51.7	2 32 10.7	14 47.3	54 10.70	+0.069	20.0	20	U	16 31.2	1.90
21.0	224 43 52.8	−2 4 25.5	14 47.9	54 12.78	+0.278	20.5	21	L	4 54.2	1.94
21.5	230 38 11.5	1 35 17.6	14 49.2	54 17.40	0.493	21.0	21	U	17 17.7	1.97
22.0	236 33 27.9	1 5 2.5	14 51.1	54 24.62	0.710	21.5	22	L	5 41.6	2.01
22.5	242 30 23.4	0 33 56.0	14 53.8	54 34.43	0.926	22.0	22	U	18 6.0	2.05
23.0	248 29 39.8	−0 2 14.6	14 57.2	54 46.82	1.137	22.5	23	L	6 30.8	2.08
23.5	254 31 59.4	+0 29 44.0	15 1.2	55 1.68	+1.340	23.0	23	U	18 55.9	2.11
24.0	260 38 3.4	1 1 41.2	15 5.9	55 18.94	1.532	23.5	24	L	7 21.4	2.14
24.5	266 48 31.4	1 33 16.8	15 11.2	55 38.38	1.705	24.0	24	U	19 47.2	2.16
25.0	273 4 0.5	2 4 9.3	15 17.1	55 59.78	1.858	24.5	25	L	8 13.1	2.17
25.5	279 25 4.2	2 33 55.5	15 23.4	56 22.86	1.983	25.0	25	U	20 39.2	2.18
26.0	285 52 10.5	+3 2 10.4	15 30.0	56 47.24	+2.075	25.5	26	L	9 5.3	2.18
26.5	292 25 41.1	3 28 27.5	15 36.9	57 12.52	2.132	26.0	26	U	21 31.4	2.17
27.0	299 5 50.4	3 52 19.3	15 43.9	57 38.23	2.146	26.5	27	L	9 57.4	2.16
27.5	305 52 44.2	4 13 17.9	15 50.9	58 3.83	2.113	27.0	27	U	22 23.3	2.16
28.0	312 46 17.2	4 30 55.4	15 57.7	58 28.76	2.035	27.5	28	L	10 49.2	2.16
28.5	319 46 13.8	+4 44 45.2	16 4.1	58 52.48	+1.909	28.0	28	U	23 15.1	2.15
Mar. 1.0	326 52 8.0	4 54 23.7	16 10.1	59 14.38	1.735	28.5	Mar. 1	L	11 40.9	2.15
1.5	334 3 22.4	4 59 30.6	16 15.4	59 33.96	1.520	29.0			. . . . .	. . .
2.0	341 19 10.5	4 59 51.1	16 20.0	59 50.71	1.266	0.0	2	U	0 6.8	2.16
2.5	348 38 37.2	4 55 16.8	16 23.7	60 4.23	0.986	0.5	2	L	12 32.8	2.17
3.0	356 0 42.1	+4 45 46.4	16 26.4	60 14.29	+0.687	1.0	3	U	0 59.0	2.19
3.5	3 24 21.5	4 31 26.2	16 28.2	60 20.67	0.377	1.5	3	L	13 25.5	2.22
4.0	10 48 31.2	4 12 30.2	16 28.9	60 23.34	+0.069	2.0	4	U	1 52.3	2.25
4.5	18 12 10.3	3 49 19.5	16 28.6	60 22.38	−0.224	2.5	4	L	14 19.6	2.29
5.0	25 34 22.5	3 22 21.4	16 27.4	60 18.04	0.497	3.0	5	U	2 47.3	2.33
5.5	32 54 18.5	+2 52 8.3	16 25.4	60 10.56	−0.743	3.5	5	L	15 15.4	2.36
6.0	40 11 17.9	2 19 15.9	16 22.6	60 0.34	0.954	4.0	6	U	3 43.9	2.40
6.5	47 24 48.9	1 44 22.0	16 19.2	59 47.80	1.131	4.5	6	L	16 12.9	2.43
7.0	54 34 28.9	1 8 5.3	16 15.3	59 33.35	1.270	5.0	7	U	4 42.1	2.44
7.5	61 40 4.2	+0 31 3.9	16 10.9	59 17.46	1.374	5.5	7	L	17 11.4	2.44
8.0	68 41 27.7	−0 6 5.3	16 6.3	59 0.49	−1.448	6.0	8	U	5 40.7	2.44
8.5	75 38 39.6	0 42 47.4	16 1.5	58 42.83	1.491	6.5	8	L	18 9.8	2.41
9.0	82 31 44.2	1 18 30.3	15 56.6	58 24.80	1.508	7.0	9	U	6 38.5	2.38
9.5	89 20 49.5	1 52 44.3	15 51.6	58 6.71	1.505	7.5	9	L	19 6.8	2.33
10.0	96 6 6.0	2 25 3.0	15 46.7	57 48.73	1.489	8.0	10	U	7 34.4	2.27
10.5	102 47 45.1	−2 55 2.9	15 41.9	57 31.03	−1.459	8.5	10	L	20 1.3	2.21
11.0	109 25 58.0	−3 22 23.3	15 37.2	57 13.74	−1.422	9.0	11	U	8 27.4	2.15

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ′ ″	° ′ ″	′ ″	′ ″	″	d				h m	m
Mar.	10.0	96 6 6.0	−2 25 3.0	15 46.7	57 48.73	−1.489	8.0	Mar.	10	U	7 34.4	2.27
	10.5	102 47 45.1	2 55 2.9	15 41.9	57 31.03	1.459	8.5		10	L	20 1.3	2.21
	11.0	109 25 58.0	3 22 23.3	15 37.2	57 13.74	1.422	9.0		11	U	8 27.4	2.15
	11.5	116 0 55.9	3 46 46.6	15 32.6	56 56.94	1.376	9.5		11	L	20 52.8	2.09
	12.0	122 32 48.0	4 7 58.2	15 28.2	56 40.72	1.329	10.0		12	U	9 17.5	2.02
	12.5	129 1 42.5	−4 25 46.5	15 23.9	56 25.04	−1.282	10.5		12	L	21 41.4	1.96
	13.0	135 27 45.7	4 40 2.5	15 19.8	56 9.96	1.232	11.0		13	U	10 4.7	1.92
	13.5	141 51 2.2	4 50 40.4	15 15.9	55 55.48	1.181	11.5		13	L	22 27.5	1.88
	14.0	148 11 35.2	4 57 36.9	15 12.1	55 41.62	1.130	12.0		14	U	10 49.8	1.85
	14.5	154 29 27.1	5 0 51.8	15 8.5	55 28.37	1.076	12.5		14	L	23 11.8	1.82
	15.0	160 44 39.6	−5 0 27.0	15 5.1	55 15.80	−1.020	13.0		15	U	11 33.4	1.79
	15.5	166 57 14.1	4 56 27.5	15 1.8	55 3.91	0.959	13.5		15	L	23 54.9	1.78
	16.0	173 7 12.9	4 49 0.2	14 58.8	54 52.80	0.893	14.0				. . . . .	. . .
	16.5	179 14 39.4	4 38 14.3	14 56.0	54 42.51	0.820	14.5		16	U	12 16.2	1.78
	17.0	185 19 38.5	4 24 20.6	14 53.5	54 33.17	0.736	15.0		17	L	0 37.6	1.78
	17.5	191 22 17.5	−4 7 31.7	14 51.2	54 24.89	−0.643	15.5		17	U	12 59.0	1.78
	18.0	197 22 45.9	3 48 1.3	14 49.3	54 17.77	0.540	16.0		18	L	1 20.5	1.80
	18.5	203 21 16.1	3 26 4.1	14 47.7	54 11.97	0.425	16.5		18	U	13 42.3	1.82
	19.0	209 18 3.9	3 1 55.5	14 46.5	54 7.61	0.298	17.0		19	L	2 4.3	1.85
	19.5	215 13 27.9	2 35 51.7	14 45.7	54 4.87	0.158	17.5		19	U	14 26.7	1.88
	20.0	221 7 49.9	−2 8 9.0	14 45.5	54 3.87	−0.006	18.0		20	L	2 49.4	1.90
	20.5	227 1 35.3	1 39 4.0	14 45.7	54 4.78	+0.160	18.5		20	U	15 12.4	1.94
	21.0	232 55 12.3	1 8 53.4	14 46.5	54 7.74	0.335	19.0		21	L	3 35.9	1.97
	21.5	238 49 12.2	0 37 54.2	14 47.9	54 12.85	0.520	19.5		21	U	15 59.7	2.00
	22.0	244 44 9.0	−0 6 23.6	14 49.9	54 20.24	0.712	20.0		22	L	4 23.9	2.03
	22.5	250 40 38.9	+0 25 21.1	14 52.6	54 29.97	+0.911	20.5		22	U	16 48.4	2.05
	23.0	256 39 19.9	0 57 1.9	14 55.9	54 42.11	1.114	21.0		23	L	5 13.1	2.08
	23.5	262 40 51.8	1 28 20.6	14 59.9	54 56.70	1.316	21.5		23	U	17 38.2	2.09
	24.0	268 45 54.6	1 58 57.8	15 4.5	55 13.67	1.513	22.0		24	L	6 3.3	2.10
	24.5	274 55 9.0	2 28 33.4	15 9.8	55 32.98	1.704	22.5		24	U	18 28.6	2.11
	25.0	281 9 14.2	+2 56 46.3	15 15.6	55 54.52	+1.882	23.0		25	L	6 54.0	2.11
	25.5	287 28 48.0	3 23 14.0	15 22.0	56 18.07	2.041	23.5		25	U	19 19.3	2.11
	26.0	293 54 24.4	3 47 32.9	15 29.0	56 43.41	2.178	24.0		26	L	7 44.7	2.11
	26.5	300 26 33.6	4 9 18.6	15 36.3	57 10.21	2.284	24.5		26	U	20 10.0	2.11
	27.0	307 5 39.4	4 28 5.8	15 43.8	57 38.07	2.352	25.0		27	L	8 35.4	2.12
	27.5	313 51 58.0	+4 43 29.2	15 51.6	58 6.49	+2.376	25.5		27	U	21 0.8	2.12
	28.0	320 45 36.3	4 55 3.6	15 59.3	58 34.90	2.352	26.0		28	L	9 26.2	2.12
	28.5	327 46 30.9	5 2 25.9	16 6.9	59 2.72	2.276	26.5		28	U	21 51.8	2.14
	29.0	334 54 25.8	5 5 15.8	16 14.1	59 29.28	2.139	27.0		29	L	10 17.6	2.16
	29.5	342 8 53.5	5 3 16.8	16 20.8	59 53.82	1.944	27.5		29	U	22 43.6	2.19
	30.0	349 29 13.2	+4 56 18.6	16 26.8	60 15.73	+1.695	28.0		30	L	11 10.1	2.22
	30.5	356 54 32.8	4 44 17.3	16 31.9	60 34.31	1.396	28.5		30	U	23 37.0	2.26
	31.0	4 23 50.0	4 27 17.5	16 35.9	60 49.07	1.055	29.0				. . . . .	. . .
	31.5	11 55 55.0	4 5 31.9	16 38.7	60 59.51	0.681	0.1		31	L	12 4.4	2.31
Apr.	1.0	19 29 33.0	3 39 22.3	16 40.3	61 5.36	+0.292	0.6	Apr.	1	U	0 32.4	2.36
	1.5	27 3 27.8	+3 9 18.2	16 40.6	61 6.52	−0.099	1.1		1	L	13 1.0	2.40
	2.0	34 36 25.5	+2 35 56.0	16 39.7	61 3.03	−0.480	1.6		2	U	1 30.1	2.45

MOON, 1919.

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Apr. 1.0	19 29 33.0	+3 39 22.3	16 40.3	61 5.36	+0.292	0.6	Apr. 1	U	0 32.4	2.36
1.5	27 3 27.8	3 9 18.2	16 40.6	61 6.52	−0.099	1.1	1	L	13 1.0	2.40
2.0	34 36 25.5	2 35 56.0	16 39.7	61 3.03	0.480	1.6	2	U	1 30.1	2.45
2.5	42 7 17.3	1 59 57.3	16 37.5	60 55.10	0.835	2.1	2	L	13 59.8	2.49
3.0	49 35 1.6	1 22 6.7	16 34.3	60 43.12	1.155	2.6	3	U	2 29.9	2.52
3.5	56 58 46.7	+0 43 10.2	16 30.0	60 27.55	−1.431	3.1	3	L	15 0.3	2.54
4.0	64 17 51.5	+0 3 52.6	16 25.0	60 8.97	1.656	3.6	4	U	3 30.8	2.53
4.5	71 31 45.3	−0 35 3.2	16 19.2	59 48.01	1.828	4.1	4	L	16 1.0	2.51
5.0	78 40 8.7	1 12 57.8	16 13.1	59 25.29	1.951	4.6	5	U	4 31.0	2.48
5.5	85 42 51.0	1 49 16.2	16 6.5	59 1.38	2.025	5.1	5	L	17 0.4	2.42
6.0	92 39 50.4	−2 23 28.1	15 59.9	58 36.86	−2.055	5.6	6	U	5 29.0	2.36
6.5	99 31 12.0	2 55 7.7	15 53.1	58 12.22	2.045	6.1	6	L	17 56.9	2.28
7.0	106 17 6.3	3 23 54.0	15 46.5	57 47.90	2.003	6.6	7	U	6 23.8	2.21
7.5	112 57 47.7	3 49 30.0	15 40.1	57 24.24	1.937	7.1	7	L	18 49.9	2.14
8.0	119 33 33.9	4 11 42.7	15 33.9	57 1.49	1.850	7.6	8	U	7 15.1	2.06
8.5	126 4 43.9	−4 30 22.6	15 28.0	56 39.91	−1.747	8.1	8	L	19 39.4	1.99
9.0	132 31 37.6	4 45 23.1	15 22.5	56 19.60	1.635	8.6	9	U	8 3.0	1.94
9.5	138 54 34.5	4 56 40.5	15 17.3	56 0.69	1.517	9.1	9	L	20 26.0	1.89
10.0	145 13 54.3	5 4 13.2	15 12.5	55 43.21	1.396	9.6	10	U	8 48.4	1.84
10.5	151 29 55.0	5 8 2.3	15 8.2	55 27.18	1.276	10.1	10	L	21 10.3	1.81
11.0	157 42 53.7	−5 8 10.6	15 4.2	55 12.58	−1.156	10.6	11	U	9 31.9	1.79
11.5	163 53 6.5	5 4 42.9	15 0.6	54 59.43	1.039	11.1	11	L	21 53.3	1.77
12.0	170 0 47.6	4 57 45.6	14 57.4	54 47.62	0.928	11.6	12	U	10 14.5	1.76
12.5	176 6 10.4	4 47 27.3	14 54.5	54 37.15	0.818	12.1	12	L	22 35.7	1.77
13.0	182 9 27.3	4 33 57.4	14 52.0	54 27.98	0.712	12.6	13	U	10 57.0	1.77
13.5	188 10 50.2	−4 17 27.4	14 49.9	54 20.06	−0.608	13.1	13	L	23 18.3	1.79
14.0	194 10 30.5	3 58 10.0	14 48.1	54 13.38	0.505	13.6	14	U	11 39.9	1.81
14.5	200 8 39.7	3 36 19.0	14 46.6	54 7.94	0.403	14.1			. . . . .	. . .
15.0	206 5 30.0	3 12 9.4	14 45.4	54 3.71	0.300	14.6	15	L	0 1.7	1.83
15.5	212 1 14.2	2 45 57.2	14 44.6	54 0.76	0.192	15.1	15	U	12 23.8	1.86
16.0	217 56 6.2	−2 17 59.1	14 44.2	53 59.11	−0.082	15.6	16	L	0 46.3	1.89
16.5	223 50 21.7	1 48 32.4	14 44.1	53 58.82	+0.034	16.1	16	U	13 9.1	1.92
17.0	229 44 17.8	1 17 55.0	14 44.4	53 59.95	0.155	16.6	17	L	1 32.3	1.95
17.5	235 38 13.5	0 46.25.1	14 45.1	54 2.58	0.285	17.1	17	U	13 55.9	1.98
18.0	241 32 29.9	−0 14 21.2	14 46.3	54 6.83	0.423	17.6	18	L	2 19.8	2.00
18.5	247 27 30.5	+0 17 58.1	14 47.9	54 12.77	+0.570	18.1	18	U	14 44.0	2.03
19.0	253 23 40.7	0 50 13.8	14 50.0	54 20.53	0.723	18.6	19	L	3 8.5	2.05
19.5	259 21 28.4	1 22 6.9	14 52.6	54 30.15	0.883	19.1	19	U	15 33.1	2.06
20.0	265 21 23.1	1 53 18.2	14 55.8	54 41.76	1.051	19.6	20	L	3 57.9	2.07
20.5	271 23 56.5	2 23 28.2	14 59.5	54 55.39	1.222	20.1	20	U	16 22.7	2.07
21.0	277 29 41.2	+2 52 17.1	15 3.8	55 11.11	+1.397	20.6	21	L	4 47.5	2.07
21.5	283 39 11.3	3 19 24.7	15 8.6	55 28.92	1.570	21.1	21	U	17 12.3	2.06
22.0	289 53 0.6	3 44 30.3	15 14.1	55 48.78	1.738	21.6	22	L	5 37.0	2.05
22.5	296 11 43.2	4 7 12.9	15 20.0	56 10.61	1.899	22.1	22	U	18 1.6	2.04
23.0	302 35 51.0	4 27 10.8	15 26.5	56 34.31	2.046	22.6	23	L	6 26.1	2.04
23.5	309 5 54.1	+4 44 2.5	15 33.4	56 59.64	+2.171	23.1	23	U	18 50.6	2.05
24.0	315 42 18.5	+4 57 26.1	15 40.6	57 26.33	+2.274	23.6	24	L	7 15.2	2.05

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Apr. 24.0	315 42 18.5	+4 57 26.1	15 40.6	57 26.33	+2.274	23.6	Apr. 24	L	7 15.2	2.05
24.5	322 25 25.7	5 7 0.5	15 48.2	57 54.08	2.343	24.1	24	U	19 39.8	2.06
25.0	329 15 30.1	5 12 25.7	15 55.9	58 22.40	2.371	24.6	25	L	8 4.6	2.07
25.5	336 12 38.3	5 13 23.7	16 3.7	58 50.80	2.354	25.1	25	U	20 29.6	2.10
26.0	343 16 47.7	5 9 39.6	16 11.3	59 18.68	2.283	25.6	26	L	8 55.0	2.13
26.5	350 27 44.5	+5 1 2.8	16 18.5	59 45.36	+2.154	26.1	26	U	21 20.8	2.18
27.0	357 45 4.0	4 47 28.4	16 25.3	60 10.15	1.967	26.6	27	L	9 47.3	2.23
27.5	5 8 9.1	4 28 58.1	16 31.3	60 32.34	1.719	27.1	27	U	22 14.4	2.29
28.0	12 36 11.8	4 5 41.5	16 36.5	60 51.20	1.417	27.6	28	L	10 42.2	2.35
28.5	20 8 13.5	3 37 56.7	16 40.5	61 6.16	1.065	28.1	28	U	23 10.9	2.42
29.0	27 43 7.4	+3 6 10.5	16 43.4	61 16.61	+0.674	28.6	29	L	11 40.3	2.48
29.5	35 19 40.3	2 30 57.6	16 44.9	61 22.25	+0.260	29.1			. . . . .	. . .
30.0	42 56 36.3	1 52 59.5	16 45.1	61 22.81	−0.166	0.3	30	U	0 10.5	2.54
30.5	50 32 39.8	1 13 3.3	16 43.9	61 18.31	0.582	0.8	30	L	12 41.3	2.59
May 1.0	58 6 38.1	+0 31 58.5	16 41.3	61 8.94	0.976	1.3	May 1	U	1 12.5	2.61
1.5	65 37 24.1	−0 9 24.2	16 37.5	60 55.03	−1.336	1.8	1	L	13 43.9	2.62
2.0	73 3 59.3	0 50 15.9	16 32.6	60 37.07	1.647	2.3	2	U	2 15.2	2.60
2.5	80 25 34.6	1 29 50.7	16 26.8	60 15.71	1.904	2.8	2	L	14 46.2	2.57
3.0	87 41 31.5	2 7 28.3	16 20.2	59 51.61	2.102	3.3	3	U	3 16.7	2.51
3.5	94 51 22.3	2 42 33.7	16 13.1	59 25.49	2.241	3.8	3	L	15 46.3	2.43
4.0	101 54 49.6	−3 14 38.2	16 5.6	58 58.06	−2.323	4.3	4	U	4 14.9	2.35
4.5	108 51 46.2	3 43 19.8	15 58.0	58 29.95	2.352	4.8	4	L	16 42.6	2.26
5.0	115 42 12.6	4 8 21.8	15 50.3	58 1.81	2.333	5.3	5	U	5 9.2	2.17
5.5	122 26 17.4	4 29 33.3	15 42.8	57 34.13	2.273	5.8	5	L	17 34.8	2.09
6.0	129 4 14.9	4 46 47.6	15 35.5	57 7.39	2.180	6.3	6	U	5 59.5	2.02
6.5	135 36 23.8	−5 0 2.0	15 28.5	56 41.91	−2.062	6.8	6	L	18 23.3	1.95
7.0	142 3 6.8	5 9 17.2	15 22.0	56 17.99	1.923	7.3	7	U	6 46.3	1.89
7.5	148 24 48.7	5 14 36.1	15 16.0	55 55.81	1.770	7.8	7	L	19 8.8	1.85
8.0	154 41 55.9	5 16 3.8	15 10.5	55 35.56	1.606	8.3	8	U	7 30.7	1.81
8.5	160 54 55.5	5 13 47.3	15 5.5	55 17.29	1.439	8.8	8	L	19 52.3	1.79
9.0	167 4 14.8	−5 7 54.5	15 1.0	55 1.03	−1.271	9.3	9	U	8 13.6	1.77
9.5	173 10 20.5	4 58 35.0	14 57.2	54 46.79	1.104	9.8	9	L	20 34.8	1.76
10.0	179 13 38.5	4 45 59.2	14 53.8	54 34.53	0.940	10.3	10	U	8 55.9	1.76
10.5	185 14 33.8	4 30 18.2	14 51.0	54 24.20	0.783	10.8	10	L	21 17.1	1.77
11.0	191 13 29.9	4 11 44.6	14 48.7	54 15.72	0.632	11.3	11	U	9 38.4	1.79
11.5	197 10 49.2	−3 50 31.2	14 46.9	54 9.00	−0.489	11.8	11	L	22 0.0	1.81
12.0	203 6 52.6	3 26 52.3	14 45.5	54 3.96	0.353	12.3	12	U	10 21.8	1.83
12.5	209 1 59.9	3 1 2.9	14 44.6	54 0.51	0.224	12.8	12	L	22 44.0	1.87
13.0	214 56 29.9	2 33 18.7	14 44.0	53 58.56	−0.101	13.3	13	U	11 6.6	1.90
13.5	220 50 40.2	2 3 56.6	14 43.9	53 58.07	+0.017	13.8	13	L	23 29.6	1.93
14.0	226 44 48.0	−1 33 13.9	14 44.1	53 58.94	+0.128	14.3	14	U	11 53.0	1.96
14.5	232 39 10.0	1 1 29.0	14 44.7	54 1.13	0.237	14.8			. . . . .	. . .
15.0	238 34 2.7	−0 29 0.7	14 45.7	54 4.62	0.345	15.3	15	L	0 16.7	1.99
15.5	244 29 42.4	+0 3 51.5	14 47.0	54 9.40	0.453	15.8	15	U	12 40.8	2.02
16.0	250 26 25.9	0 36 47.8	14 48.6	54 15.46	0.558	16.3	16	L	1 5.2	2.05
16.5	256 24 30.6	+1 9 27.8	14 50.6	54 22.80	+0.667	16.8	16	U	13 29.9	2.06
17.0	262 24 14.3	+1 41 31.1	14 53.0	54 31.48	+0.781	17.3	17	L	1 54.6	2.06

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
May 17.0	262 24 14.3	+1 41 31.1	14 53.0	54 31.48	+0.781	17.3	May 17	L	1 54.6	2.06
17.5	268 25 55.8	2 12 37.3	14 55.7	54 41.54	0.895	17.8	17	U	14 19.4	2.07
18.0	274 29 55.0	2 42 25.8	14 58.9	54 52.98	1.015	18.3	18	L	2 44.2	2.07
18.5	280 36 32.4	3 10 35.9	15 2.4	55 5.92	1.140	18.8	18	U	15 8.9	2.05
19.0	286 46 9.9	3 36 47.6	15 6.3	55 20.34	1.264	19.3	19	L	3 33.4	2.04
19.5	292 59 9.7	+4 0 40.4	15 10.6	55 36.28	+1.393	19.8	19	U	15 57.8	2.02
20.0	299 15 55.3	4 21 54.9	15 15.4	55 53.78	1.523	20.3	20	L	4 22.0	2.01
20.5	305 36 49.4	4 40 11.5	15 20.6	56 12.81	1.648	20.8	20	U	16 46.1	2.00
21.0	312 2 15.2	4 55 11.4	15 26.2	56 33.31	1.766	21.3	21	L	5 10.0	1.99
21.5	318 32 34.7	5 6 36.8	15 32.2	56 55.16	1.876	21.8	21	U	17 33.9	1.99
22.0	325 8 7.8	+5 14 10.5	15 38.4	57 18.27	+1.971	22.3	22	L	5 57.8	1.99
22.5	331 49 12.2	5 17 37.5	15 45.0	57 42.38	2.043	22.8	22	U	18 21.8	2.01
23.0	338 36 2.1	5 16 44.1	15 51.8	58 7.21	2.091	23.3	23	L	6 46.0	2.03
23.5	345 28 46.6	5 11 19.8	15 58.7	58 32.44	2.107	23.8	23	U	19 10.6	2.07
24.0	352 27 29.4	5 1 17.3	16 5.5	58 57.61	2.081	24.3	24	L	7 35.6	2.10
24.5	359 32 7.3	+4 46 33.6	16 12.2	59 22.22	+2.013	24.8	24	U	20 1.1	2.16
25.0	6 42 28.7	4 27 11.0	16 18.6	59 45.72	1.896	25.3	25	L	8 27.4	2.22
25.5	13 58 14.1	4 3 18.1	16 24.6	60 7.51	1.726	25.8	25	U	20 54.4	2.29
26.0	21 18 54.0	3 35 10.0	16 29.9	60 26.94	1.502	26.3	26	L	9 22.3	2.36
26.5	28 43 50.6	3 3 9.3	16 34.3	60 43.37	1.228	26.8	26	U	21 51.1	2.44
27.0	36 12 16.4	+2 27 46.0	16 37.8	60 56.24	+0.910	27.3	27	L	10 20.8	2.51
27.5	43 43 16.6	1 49 36.8	16 40.2	61 5.05	0.553	27.8	27	U	22 51.3	2.57
28.0	51 15 49.9	1 9 24.7	16 41.4	61 9.40	+0.170	28.3	28	L	11 22.5	2.62
28.5	58 48 51.3	+0 27 56.9	16 41.3	61 9.08	−0.225	28.8	28	U	23 54.0	2.64
29.0	66 21 12.9	−0 13 56.6	16 40.0	61 4.00	0.620	29.3			. . . . .	. . .
29.5	73 51 47.8	−0 55 25.4	16 37.3	60 54.26	−0.998	0.5	29	L	12 25.7	2.64
30.0	81 19 31.9	1 35 41.0	16 33.5	60 40.16	1.346	1.0	30	U	0 57.3	2.62
30.5	88 43 26.4	2 13 58.3	16 28.5	60 22.12	1.652	1.5	30	L	13 28.4	2.57
31.0	96 2 39.5	2 49 37.8	16 22.7	60 0.70	1.908	2.0	31	U	1 58.8	2.50
31.5	103 16 27.7	3 22 6.1	16 16.1	59 36.53	2.111	2.5	31	L	14 28.3	2.42
June 1.0	110 24 17.5	−3 50 57.1	16 9.0	59 10.26	−2.254	3.0	June 1	U	2 56.8	2.33
1.5	117 25 44.8	4 15 51.5	16 1.4	58 42.65	2.341	3.5	1	L	15 24.2	2.24
2.0	124 20 35.7	4 36 36.7	15 53.7	58 14.30	2.374	4.0	2	U	3 50.6	2.15
2.5	131 8 45.2	4 53 6.1	15 46.0	57 45.88	2.356	4.5	2	L	16 15.9	2.07
3.0	137 50 17.5	5 5 18.3	15 38.3	57 17.92	2.296	5.0	3	U	4 40.3	2.00
3.5	144 25 23.3	−5 13 15.8	15 31.0	56 50.93	−2.198	5.5	3	L	17 3.9	1.94
4.0	150 54 20.6	5 17 4.6	15 24.0	56 25.30	2.069	6.0	4	U	5 26.8	1.88
4.5	157 17 31.9	5 16 53.4	15 17.5	56 1.37	1.916	6.5	4	L	17 49.1	1.84
5.0	163 35 24.0	5 12 52.6	15 11.5	55 39.39	1.745	7.0	5	U	6 11.0	1.81
5.5	169 48 26.7	5 5 13.5	15 6.1	55 19.53	1.562	7.5	5	L	18 32.5	1.79
6.0	175 57 11.7	−4 54 9.0	15 1.3	55 1.93	−1.370	8.0	6	U	6 53.9	1.78
6.5	182 2 12.0	4 39 52.0	14 57.1	54 46.66	1.174	8.5	6	L	19 15.2	1.77
7.0	188 4 1.1	4 22 36.2	14 53.6	54 33.75	0.978	9.0	7	U	7 36.5	1.78
7.5	194 3 12.6	4 2 35.5	14 50.7	54 23.18	0.785	9.5	7	L	19 57.9	1.80
8.0	200 0 19.0	3 40 4.0	14 48.5	54 14.88	0.598	10.0	8	U	8 19.6	1.82
8.5	205 55 52.6	−3 15 16.7	14 46.8	54 8.81	−0.416	10.5	8	L	20 41.5	1.84
9.0	211 50 23.5	−2 48 28.6	14 45.7	54 4.85	−0.244	11.0	9	U	9 3.8	1.87

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
ne 9.0	211 50 23.5	−2 48 28.6	14 45.7	54 4.85	−0.244	11.0	June 9	U	9 3.8	1.87
9.5	217 44 20.9	2 19 55.4	14 45.2	54 2.91	−0.082	11.5	9	L	21 26.5	1.91
10.0	223 38 11.9	1 49 53.5	14 45.2	54 2.84	+0.068	12.0	10	U	9 49.6	1.95
10.5	229 32 21.8	1 18 39.8	14 45.6	54 4.50	0.208	12.5	10	L	22 13.2	1.98
11.0	235 27 14.0	0 46 32.5	14 46.5	54 7.79	0.337	13.0	11	U	10 37.1	2.01
11.5	241 23 10.1	−0 13 50.0	14 47.8	54 12.56	+0.457	13.5	11	L	23 1.4	2.04
12.0	247 20 29.7	+0 19 8.1	14 49.5	54 18.72	0.565	14.0	12	U	11 26.0	2.06
12.5	253 19 30.4	0 52 1.8	14 51.5	54 26.09	0.663	14.5	12	L	23 50.8	2.08
13.0	259 20 28.4	1 24 30.1	14 53.8	54 34.61	0.755	15.0			. . . . .	. . .
13.5	265 23 38.0	1 56 11.7	14 56.5	54 44.19	0.839	15.5	13	U	12 15.8	2.08
14.0	271 29 12.3	+2 26 45.2	14 59.3	54 54.73	+0.917	16.0	14	L	0 40.8	2.08
14.5	277 37 23.3	2 55 48.6	15 2.4	55 6.18	0.991	16.5	14	U	13 5.8	2.08
15.0	283 48 21.5	3 23 0.4	15 5.8	55 18.50	1.062	17.0	15	L	1 30.6	2.06
15.5	290 2 17.1	3 47 59.5	15 9.4	55 31.65	1.130	17.5	15	U	13 55.3	2.05
16.0	296 19 19.6	4 10 25.3	15 13.2	55 45.62	1.197	18.0	16	L	2 19.8	2.03
16.5	302 39 37.6	+4 29 58.0	15 17.2	56 0.37	+1.262	18.5	16	U	14 44.1	2.01
17.0	309 3 20.2	4 46 19.3	15 21.5	56 15.92	1.329	19.0	17	L	3 8.1	1.99
17.5	315 30 35.9	4 59 12.2	15 25.9	56 32.26	1.391	19.5	17	U	15 31.9	1.98
18.0	322 1 33.0	5 8 21.4	15 30.6	56 49.29	1.451	20.0	18	L	3 55.6	1.97
18.5	328 36 19.8	5 13 33.7	15 35.5	57 7.07	1.509	20.5	18	U	16 19.3	1.97
19.0	335 15 3.7	+5 14 38.1	15 40.4	57 25.48	+1.558	21.0	19	L	4 43.0	1.98
19.5	341 57 51.9	5 11 26.5	15 45.6	57 44.41	1.595	21.5	19	U	17 6.8	1.99
20.0	348 44 50.3	5 3 53.5	15 50.8	58 3.71	1.620	22.0	20	L	5 30.8	2.02
20.5	355 36 2.9	4 51 57.3	15 56.1	58 23.21	1.627	22.5	20	U	17 55.3	2.06
21.0	2 31 31.7	4 35 40.1	16 1.4	58 42.65	1.608	23.0	21	L	6 20.2	2.10
21.5	9 31 15.7	+4 15 8.0	16 6.6	59 1.70	+1.564	23.5	21	U	18 45.7	2.15
22.0	16 35 10.1	3 50 32.2	16 11.6	59 20.06	1.489	24.0	22	L	7 11.9	2.22
22.5	23 43 5.9	3 22 9.0	16 16.3	59 37.28	1.375	24.5	22	U	19 39.0	2.29
23.0	30 54 48.3	2 50 19.9	16 20.6	59 52.92	1.226	25.0	23	L	8 6.9	2.36
23.5	38 9 57.3	2 15 32.0	16 24.3	60 6.55	1.040	25.5	23	U	20 35.6	2.43
24.0	45 28 6.1	+1 38 17.9	16 27.3	60 17.72	+0.814	26.0	24	L	9 5.2	2.50
24.5	52 48 41.9	0 59 14.7	16 29.6	60 25.96	0.554	26.5	24	U	21 35.6	2.55
25.0	60 11 5.5	+0 19 4.0	16 30.9	60 30.91	+0.266	27.0	25	L	10 6.4	2.59
25.5	67 34 31.9	−0 21 30.3	16 31.3	60 32.27	−0.043	27.5	25	U	22 37.6	2.60
26.0	74 58 11.6	1 1 42.0	16 30.7	60 29.84	0.364	28.0	26	L	11 8.8	2.59
26.5	82 21 11.6	−1 40 45.9	16 28.9	60 23.54	−0.684	28.5	26	U	23 39.7	2.56
27.0	89 42 37.5	2 17 58.6	16 26.2	60 13.46	0.995	29.0			. . . . .	. . .
27.5	97 1 35.3	2 52 39.8	16 22.4	59 59.75	1.284	0.1	27	L	12 10.2	2.52
28.0	104 17 12.7	3 24 15.0	16 17.8	59 42.76	1.542	0.6	28	U	0 40.0	2.44
28.5	111 28 42.4	3 52 15.1	16 12.4	59 22.90	1.762	1.1	28	L	13 8.8	2.36
29.0	118 35 22.5	−4 16 17.9	16 6.3	59 0.64	−1.938	1.6	29	U	1 36.7	2.28
29.5	125 36 38.3	4 36 8.1	15 59.8	58 36.58	2.065	2.1	29	L	14 3.6	2.20
30.0	132 32 3.4	4 51 36.7	15 52.9	58 11.27	2.144	2.6	30	U	2 29.5	2.12
30.5	139 21 20.4	5 2 41.1	15 45.8	57 45.32	2.174	3.1	30	L	14 54.5	2.05
uly 1.0	146 4 20.8	5 9 23.5	15 38.7	57 19.27	2.160	3.6	July 1	U	3 18.7	1.98
1.5	152 41 4.0	−5 11 50.4	15 31.7	56 53.64	−2.105	4.1	1	L	15 42.1	1.92
2.0	159 11 37.9	−5 10 11.9	15 25.0	56 28.90	−2.012	4.6	2	U	4 4.9	1.88

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
July 1.0	146 4 20.8	−5 9 23.5	15 38.7	57 19.27	−2.160	3.6	July 1	U	3 18.7	1.98
1.5	152 41 4.0	5 11 50.4	15 31.7	56 53.64	2.105	4.1	1	L	15 42.1	1.92
2.0	159 11 37.9	5 10 11.9	15 25.0	56 28.90	2.012	4.6	2	U	4 4.9	1.88
2.5	165 36 17.5	5 4 40.5	15 18.6	56 5.47	1.889	5.1	2	L	16 27.3	1.85
3.0	171 55 23.9	4 55 30.1	15 12.7	55 43.68	1.739	5.6	3	U	4 49.3	1.82
3.5	178 9 23.2	−4 42 56.0	15 7.3	55 23.83	−1.567	6.1	3	L	17 11.0	1.80
4.0	184 18 45.9	4 27 13.9	15 2.4	55 6.13	1.381	6.6	4	U	5 32.6	1.80
4.5	190 24 5.5	4 8 39.9	14 58.2	54 50.74	1.182	7.1	4	L	17 54.2	1.80
5.0	196 25 57.7	3 47 29.8	14 54.7	54 37.79	0.976	7.6	5	U	6 15.9	1.82
5.5	202 24 59.8	3 23 59.9	14 51.9	54 27.32	0.767	8.1	5	L	18 37.8	1.83
6.0	208 21 49.9	−2 58 25.9	14 49.7	54 19.38	−0.558	8.6	6	U	6 59.9	1.85
6.5	214 17 6.0	2 31 3.7	14 48.2	54 13.92	0.351	9.1	6	L	19 22.3	1.88
7.0	220 11 25.8	2 2 9.3	14 47.4	54 10.93	−0.150	9.6	7	U	7 45.1	1.92
7.5	226 5 25.9	1 31 58.9	14 47.2	54 10.28	+0.042	10.1	7	L	20 8.3	1.95
8.0	231 59 41.6	1 0 49.3	14 47.7	54 11.90	0.224	10.6	8	U	8 31.9	1.98
8.5	237 54 46.2	−0 28 57.4	14 48.7	54 15.62	+0.394	11.1	8	L	20 55.9	2.02
9.0	243 51 10.9	+0 3 18.6	14 50.2	54 21.30	0.550	11.6	9	U	9 20.3	2.05
9.5	249 49 24.4	0 35 40.4	14 52.2	54 28.77	0.692	12.1	9	L	21 45.0	2.07
10.0	255 49 52.2	1 7 48.3	14 54.7	54 37.85	0.819	12.6	10	U	10 10.0	2.09
10.5	261 52 57.1	1 39 21.8	14 57.6	54 48.35	0.929	13.1	10	L	22 35.1	2.10
11.0	267 58 58.3	+2 10 0.0	15 0.8	55 0.07	+1.021	13.6	11	U	11 0.3	2.10
11.5	274 8 11.7	2 39 21.0	15 4.3	55 12.79	1.097	14.1	11	L	23 25.5	2.10
12.0	280 20 49.3	3 7 2.6	15 7.9	55 26.33	1.157	14.6	12	U	11 50.6	2.09
12.5	286 36 59.7	3 32 42.4	15 11.8	55 40.50	1.202	15.1			. . . . .	. . .
13.0	292 56 48.1	3 55 58.5	15 15.8	55 55.13	1.234	15.6	13	L	0 15.6	2.08
13.5	299 20 16.3	+4 16 29.4	15 19.9	56 10.06	+1.253	16.1	13	U	12 40.4	2.05
14.0	305 47 22.8	4 33 54.7	15 24.0	56 25.15	1.259	16.6	14	L	1 4.9	2.04
14.5	312 18 3.6	4 47 56.0	15 28.1	56 40.24	1.256	17.1	14	U	13 29.3	2.02
15.0	318 52 12.8	4 58 16.8	15 32.2	56 55.27	1.246	17.6	15	L	1 53.4	2.00
15.5	325 29 42.5	5 4 43.2	15 36.2	57 10.12	1.230	18.1	15	U	14 17.4	2.00
16.0	332 10 24.0	+5 7 4.3	15 40.2	57 24.78	+1.211	18.6	16	L	2 41.4	2.00
16.5	338 54 7.8	5 5 12.6	15 44.1	57 39.15	1.184	19.1	16	U	15 5.3	1.99
17.0	345 40 44.7	4 59 4.3	15 48.0	57 53.19	1.156	19.6	17	L	3 29.3	2.01
17.5	352 30 6.1	4 48 39.5	15 51.7	58 6.88	1.124	20.1	17	U	15 53.5	2.02
18.0	359 22 3.3	4 34 2.2	15 55.3	58 20.15	1.088	20.6	18	L	4 17.9	2.05
18.5	6 16 29.4	+4 15 20.6	15 58.8	58 32.96	+1.045	21.1	18	U	16 42.8	2.09
19.0	13 13 17.8	3 52 46.9	16 2.1	58 45.19	0.993	21.6	19	L	5 8.2	2.14
19.5	20 12 22.1	3 26 37.8	16 5.3	58 56.75	0.931	22.1	19	U	17 34.2	2.19
20.0	27 13 36.8	2 57 13.5	16 8.2	59 7.49	0.858	22.6	20	L	6 0.8	2.25
20.5	34 16 55.1	2 24 58.7	16 10.9	59 17.27	0.769	23.1	20	U	18 28.2	2.31
21.0	41 22 9.4	+1 50 21.4	16 13.2	59 25.87	+0.661	23.6	21	L	6 56.3	2.37
21.5	48 29 10.2	1 13 53.1	16 15.2	59 33.06	0.534	24.1	21	U	19 25.1	2.43
22.0	55 37 45.1	+0 36 8.1	16 16.7	59 38.61	0.388	24.6	22	L	7 54.5	2.47
22.5	62 47 38.4	−0 2 16.7	16 17.7	59 42.29	0.221	25.1	22	U	20 24.4	2.51
23.0	69 58 30.2	0 40 42.6	16 18.1	59 43.84	+0.037	25.6	23	L	8 54.6	2.52
23.5	77 9 56.3	−1 18 30.5	16 17.9	59 43.11	−0.163	26.1	23	U	21 24.9	2.52
24.0	84 21 28.1	−1 55 1.3	16 17.0	59 39.87	−0.378	26.6	24	L	9 55.0	2.49

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
July 24.0	84 21 28.1	−1 55 1.3	16 17.0	59 39.87	−0.378	26.6	July 24	L	9 55.0	2.49
24.5	91 32 33.3	2 29 37.4	16 15.4	59 34.02	0.596	27.1	24	U	22 24.7	2.46
25.0	98 42 35.2	3 1 43.7	16 13.1	59 25.57	0.814	27.6	25	L	10 53.9	2.41
25.5	105 50 55.8	3 30 48.5	16 10.1	59 14.50	1.029	28.1	25	U	23 22.4	2.34
26.0	112 56 55.1	3 56 25.0	16 6.4	59 0.94	1.227	28.6	26	L	11 50.1	2.27
26.5	119 59 54.2	−4 18 11.5	16 2.1	58 45.12	−1.407	29.1			. . . . .	. . .
27.0	126 59 15.6	4 35 52.2	15 57.3	58 27.27	1.560	0.3	27	U	0 16.9	2.20
27.5	133 54 25.7	4 49 17.0	15 51.9	58 7.79	1.683	0.8	27	L	12 42.9	2.13
28.0	140 44 55.4	4 58 21.6	15 46.3	57 47.01	1.774	1.3	28	U	1 8.0	2.06
28.5	147 30 21.7	5 3 7.2	15 40.4	57 25.36	1.827	1.8	28	L	13 32.4	2.01
29.0	154 10 28.9	−5 3 39.4	15 34.4	57 3.30	−1.844	2.3	29	U	1 56.2	1.96
29.5	160 45 8.1	5 0 8.0	15 28.4	56 41.24	1.826	2.8	29	L	14 19.4	1.91
30.0	167 14 17.7	4 52 45.5	15 22.5	56 19.62	1.772	3.3	30	U	2 42.1	1.88
30.5	173 38 3.8	4 41 47.1	15 16.8	55 58.84	1.687	3.8	30	L	15 4.5	1.85
31.0	179 56 39.0	4 27 29.5	15 11.5	55 39.25	1.573	4.3	31	U	3 26.6	1.84
31.5	186 10 22.3	−4 10 10.1	15 6.5	55 21.19	−1.434	4.8	31	L	15 48.6	1.83
Aug. 1.0	192 19 37.6	3 50 6.9	15 2.1	55 4.92	1.273	5.3	Aug. 1	U	4 10.5	1.83
1.5	198 24 54.0	3 27 37.9	14 58.2	54 50.71	1.094	5.8	1	L	16 32.5	1.84
2.0	204 26 44.3	3 3 1.1	14 55.0	54 38.72	0.902	6.3	2	U	4 54.7	1.85
2.5	210 25 44.3	2 36 33.7	14 52.3	54 29.10	0.698	6.8	2	L	17 17.0	1.87
3.0	216 22 32.2	−2 8 33.0	14 50.4	54 21.99	−0.486	7.3	3	U	5 39.6	1.90
3.5	222 17 47.4	1 39 15.8	14 49.2	54 17.44	0.273	7.8	3	L	18 2.5	1.92
4.0	228 12 10.6	1 8 58.9	14 48.6	54 15.45	−0.058	8.3	4	U	6 25.7	1.95
4.5	234 6 22.7	0 37 58.9	14 48.8	54 16.05	+0.156	8.8	4	L	18 49.3	1.98
5.0	240 1 4.1	−0 6 32.4	14 49.6	54 19.16	0.362	9.3	5	U	7 13.3	2.01
5.5	245 56 54.3	+0 25 3.1	14 51.1	54 24.71	+0.560	9.8	5	L	19 37.6	2.04
6.0	251 54 31.5	0 56 30.2	14 53.3	54 32.55	0.747	10.3	6	U	8 2.2	2.06
6.5	257 54 31.4	1 27 30.3	14 56.0	54 42.59	0.921	10.8	6	L	20 27.1	2.08
7.0	263 57 27.3	1 57 44.5	14 59.3	54 54.59	1.076	11.3	7	U	8 52.1	2.09
7.5	270 3 49.0	2 26 52.4	15 3.0	55 8.35	1.213	11.8	7	L	21 17.3	2.10
8.0	276 14 2.3	+2 54 33.5	15 7.2	55 23.62	+1.328	12.3	8	U	9 42.5	2.10
8.5	282 28 28.5	3 20 26.0	15 11.7	55 40.12	1.420	12.8	8	L	22 7.7	2.10
9.0	288 47 23.7	3 44 7.8	15 16.5	55 57.59	1.486	13.3	9	U	10 32.8	2.09
9.5	295 10 58.9	4 5 16.8	15 21.4	56 15.69	1.527	13.8	9	L	22 57.8	2.08
10.0	301 39 18.6	4 23 31.2	15 26.4	56 34.13	1.541	14.3	10	U	11 22.7	2.07
10.5	308 12 21.7	+4 38 30.1	15 31.4	56 52.57	+1.529	14.8	10	L	23 47.4	2.05
11.0	314 50 1.2	4 49 54.1	15 36.4	57 10.72	1.493	15.3			. . . . .	. . .
11.5	321 32 4.2	4 57 26.5	15 41.2	57 28.30	1.433	15.8	11	U	12 12.0	2.04
12.0	328 18 12.9	5 0 53.3	15 45.7	57 45.02	1.351	16.3	12	L	0 36.5	2.04
12.5	335 8 4.7	5 0 4.4	15 50.0	58 0.65	1.252	16.8	12	U	13 1.0	2.04
13.0	342 1 14.3	+4 54 54.0	15 53.9	58 15.02	+1.141	17.3	13	L	1 25.5	2.04
13.5	348 57 14.3	4 45 21.3	15 57.4	58 27.99	1.019	17.8	13	U	13 50.1	2.06
14.0	355 55 35.9	4 31 30.2	16 0.6	58 39.46	0.891	18.3	14	L	2 15.0	2.08
14.5	2 55 51.4	4 13 29.9	16 3.3	58 49.37	0.760	18.8	14	U	14 40.0	2.10
15.0	9 57 34.0	3 51 34.8	16 5.5	58 57.71	0.630	19.3	15	L	3 5.5	2.14
15.5	17 0 19.7	+3 26 3.5	16 7.4	59 4.50	+0.502	19.8	15	U	15 31.4	2.18
16.0	24 3 47.2	+2 57 19.3	16 8.8	59 9.79	+0.380	20.3	16	L	3 57.8	2.22

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
		° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Aug.	16.0	24 3 47.2	+2 57 19.3	16 8.8	59 9.79	+0.380	20.3	Aug. 16	L	3 57.8	2.22
	16.5	31 7 38.8	2 25 48.7	16 9.9	59 13.65	0.263	20.8	16	U	16 24.8	2.28
	17.0	38 11 39.9	1 52 1.7	16 10.6	59 16.13	0.152	21.3	17	L	4 52.4	2.33
	17.5	45 15 39.1	1 16 30.4	16 10.9	59 17.31	+0.045	21.8	17	U	17 20.6	2.36
	18.0	52 19 27.6	0 39 48.8	16 10.9	59 17.22	−0.059	22.3	18	L	5 49.1	2.40
	18.5	59 22 58.0	+0 2 31.7	16 10.5	59 15.90	−0.159	22.8	18	U	18 18.2	2.44
	19.0	66 26 3.9	−0 34 45.3	16 9.8	59 13.40	0.259	23.3	19	L	6 47.6	2.45
	19.5	73 28 39.1	1 11 27.0	16 8.8	59 9.68	0.361	23.8	19	U	19 17.0	2.45
	20.0	80 30 36.1	1 46 58.6	16 7.5	59 4.73	0.464	24.3	20	L	7 46.4	2.44
	20.5	87 31 45.9	2 20 47.2	16 5.8	58 58.53	0.570	24.8	20	U	20 15.6	2.42
	21.0	94 31 57.1	−2 52 21.7	16 3.7	58 51.05	−0.678	25.3	21	L	8 44.4	2.38
	21.5	101 30 55.7	3 21 13.4	16 1.3	58 42.26	0.788	25.8	21	U	21 12.7	2.33
	22.0	108 28 24.7	3 46 57.2	15 58.6	58 32.14	0.900	26.3	22	L	9 40.3	2.27
	22.5	115 24 5.0	4 9 11.2	15 55.5	58 20.68	1.009	26.8	22	U	22 7.2	2.21
	23.0	122 17 34.9	4 27 38.2	15 52.0	58 7.95	1.114	27.3	23	L	10 33.3	2.15
	23.5	129 8 31.6	−4 42 5.2	15 48.2	57 53.98	−1.213	27.8	23	U	22 58.8	2.10
	24.0	135 56 31.8	4 52 24.1	15 44.1	57 38.89	1.300	28.3	24	L	11 23.6	2.04
	24.5	142 41 12.7	4 58 31.5	15 39.7	57 22.84	1.373	28.8	24	U	23 47.7	1.99
	25.0	149 22 13.8	5 0 28.3	15 35.1	57 6.00	1.430	29.3			. . . . .	. . .
	25.5	155 59 16.6	4 58 20.0	15 30.4	56 48.60	1.467	0.3	25	L	12 11.3	1.95
	26.0	162 32 6.9	−4 52 15.5	15 25.5	56 30.88	−1.482	0.8	26	U	0 34.5	1.91
	26.5	169 0 35.0	4 42 27.2	15 20.7	56 13.14	1.471	1.3	26	L	12 57.2	1.88
	27.0	175 24 35.9	4 29 10.1	15 15.9	55 55.66	1.438	1.8	27	U	1 19.7	1.87
	27.5	181 44 10.4	4 12 41.0	15 11.3	55 38.73	1.380	2.3	27	L	13 42.1	1.86
	28.0	187 59 24.7	3 53 18.0	15 6.9	55 22.63	1.298	2.8	28	U	2 4.3	1.84
	28.5	194 10 30.4	−3 31 20.3	15 2.8	55 7.66	−1.194	3.3	28	L	14 26.4	1.85
	29.0	200 17 44.6	3 7 7.2	14 59.1	54 54.06	1.067	3.8	29	U	2 48.7	1.86
	29.5	206 21 29.0	2 40 58.0	14 55.9	54 42.13	0.920	4.3	29	L	15 11.0	1.87
	30.0	212 22 9.6	2 13 11.8	14 53.1	54 32.05	0.756	4.8	30	U	3 33.5	1.89
	30.5	218 20 16.7	1 44 7.4	14 51.0	54 24.05	0.575	5.3	30	L	15 56.3	1.91
	31.0	224 16 23.6	−1 14 2.7	14 49.4	54 18.30	−0.383	5.8	31	U	4 19.3	1.93
	31.5	230 11 6.5	0 43 15.6	14 48.5	54 14.90	−0.181	6.3	31	L	16 42.6	1.96
Sept.	1.0	236 5 3.9	−0 12 3.3	14 48.2	54 13.99	+0.030	6.8	Sept. 1	U	5 6.2	1.98
	1.5	241 58 55.9	+0 19 17.1	14 48.7	54 15.64	0.245	7.3	1	L	17 30.1	2.00
	2.0	247 53 23.5	0 50 28.5	14 49.8	54 19.88	0.461	7.8	2	U	5 54.2	2.02
	2.5	253 49 8.4	+1 21 13.9	14 51.7	54 26.70	+0.676	8.3	2	L	18 18.6	2.04
	3.0	259 46 51.8	1 51 15.8	14 54.2	54 36.08	0.885	8.8	3	U	6 43.2	2.05
	3.5	265 47 14.4	2 20 16.5	14 57.5	54 47.91	1.086	9.3	3	L	19 7.9	2.07
	4.0	271 50 55.0	2 47 57.2	15 1.3	55 2.09	1.275	9.8	4	U	7 32.8	2.08
	4.5	277 58 30.3	3 13 58.8	15 5.8	55 18.44	1.447	10.3	4	L	19 57.7	2.08
	5.0	284 10 33.2	+3 38 1.2	15 10.8	55 36.73	+1.598	10.8	5	U	8 22.6	2.08
	5.5	290 27 33.3	3 59 43.7	15 16.2	55 56.70	1.725	11.3	5	L	20 47.5	2.07
	6.0	296 49 54.6	4 18 45.4	15 22.0	56 18.03	1.825	11.8	6	U	9 12.3	2.07
	6.5	303 17 54.9	4 34 45.0	15 28.1	56 40.37	1.892	12.3	6	L	21 37.2	2.07
	7.0	309 51 45.3	4 47 21.9	15 34.4	57 3.30	1.923	12.8	7	U	10 1.9	2.06
	7.5	316 31 29.4	+4 56 16.4	15 40.7	57 26.38	+1.917	13.3	7	L	22 26.7	2.07
	8.0	323 17 2.0	+5 1 11.1	15 46.9	57 49.16	+1.872	13.8	8	U	10 51.5	2.07

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ′ ″	° ′ ″	′ ″	′ ″	″	d				h m	m
Sept.	8.0	323 17 2.0	+5 1 11.1	15 46.9	57 49.16	+1.872	13.8	Sept.	8	U	10 51.5	2.07
	8.5	330 8 10.2	5 1 51.3	15 52.9	58 11.15	1.788	14.3		8	L	23 16.4	2.08
	9.0	337 4 32.1	4 58 6.0	15 58.5	58 31.92	1.666	14.8		9	U	11 41.4	2.10
	9.5	344 5 38.5	4 49 49.1	16 3.7	58 51.00	1.508	15.3				. . . . .	. . .
	10.0	351 10 53.3	4 37 0.2	16 8.4	59 8.00	1.320	15.8		10	L	0 6.7	2.12
	10.5	358 19 35.0	+4 19 44.6	16 12.3	59 22.58	+1.107	16.3		10	U	12 32.2	2.14
	11.0	5 30 58.6	3 58 14.6	16 15.6	59 34.50	0.876	16.8		11	L	0 58.1	2.18
	11.5	12 44 17.1	3 32 48.5	16 18.0	59 43.57	0.635	17.3		11	U	13 24.5	2.22
	12.0	19 58 44.1	3 3 50.6	16 19.7	59 49.74	0.393	17.8		12	L	1 51.3	2.26
	12.5	27 13 35.3	2 31 50.4	16 20.6	59 53.01	+0.154	18.3		12	U	14 18.7	2.30
	13.0	34 28 9.4	+1 57 21.6	16 20.8	59 53.49	−0.072	18.8		13	L	2 46.6	2.35
	13.5	41 41 50.7	1 21 1.0	16 20.2	59 51.34	0.282	19.3		13	U	15 15.1	2.39
	14.0	48 54 8.4	0 43 27.1	16 18.9	59 46.81	0.469	19.8		14	L	3 44.0	2.42
	14.5	56 4 37.8	+0 5 19.0	16 17.1	59 40.18	0.633	20.3		14	U	16 13.2	2.45
	15.0	63 13 0.0	−0 32 44.4	16 14.8	59 31.72	0.772	20.8		15	L	4 42.7	2.47
	15.5	70 19 1.5	−1 10 5.9	16 12.1	59 21.74	−0.888	21.3		15	U	17 12.3	2.46
	16.0	77 22 32.7	1 46 10.2	16 9.0	59 10.50	0.981	21.8		16	L	5 41.7	2.44
	16.5	84 23 28.1	2 20 24.7	16 5.7	58 58.27	1.053	22.3		16	U	18 10.9	2.41
	17.0	91 21 44.4	2 52 20.0	16 2.2	58 45.28	1.110	22.8		17	L	6 39.6	2.37
	17.5	98 17 20.0	3 21 29.8	15 58.5	58 31.68	1.152	23.3		17	U	19 7.8	2.32
	18.0	105 10 14.4	−3 47 31.6	15 54.6	58 17.69	−1.180	23.8		18	L	7 35.3	2.26
	18.5	112 0 26.5	4 10 6.3	15 50.7	58 3.38	1.203	24.3		18	U	20 2.1	2.20
	19.0	118 47 55.4	4 28 59.0	15 46.8	57 48.85	1.218	24.8		19	L	8 28.2	2.14
	19.5	125 32 38.2	4 43 58.1	15 42.8	57 34.16	1.229	25.3		19	U	20 53.6	2.09
	20.0	132 14 31.8	4 54 55.8	15 38.7	57 19.37	1.236	25.8		20	L	9 18.4	2.04
	20.5	138 53 31.5	−5 1 48.3	15 34.7	57 4.50	−1.241	26.3		20	U	21 42.5	1.99
	21.0	145 29 31.8	5 4 35.3	15 30.6	56 49.60	1.241	26.8		21	L	10 6.1	1.94
	21.5	152 2 26.6	5 3 19.9	15 26.6	56 34.72	1.239	27.3		21	U	22 29.2	1.91
	22.0	158 32 9.6	4 58 8.6	15 22.5	56 19.88	1.232	27.8		22	L	10 52.0	1.89
	22.5	164 58 35.4	4 49 11.0	15 18.5	56 5.18	1.218	28.3		22	U	23 14.5	1.87
	23.0	171 21 39.3	−4 36 39.3	15 14.6	55 50.69	−1.196	28.8		23	L	11 36.8	1.85
	23.5	177 41 18.3	4 20 48.1	15 10.7	55 36.52	1.165	29.3		23	U	23 59.0	1.85
	24.0	183 57 32.0	4 1 54.0	15 7.0	55 22.78	1.122	0.3				. . . . .	. . .
	24.5	190 10 22.4	3 40 14.9	15 3.4	55 9.65	1.065	0.8		24	L	12 21.2	1.85
	25.0	196 19 54.6	3 16 10.1	15 0.0	54 57.27	0.995	1.3		25	U	0 43.4	1.85
	25.5	202 26 17.4	−2 49 59.2	14 56.9	54 45.82	−0.911	1.8		25	L	13 5.7	1.86
	26.0	208 29 42.7	2 22 2.6	14 54.1	54 35.47	0.810	2.3		26	U	1 28.1	1.88
	26.5	214 30 26.4	1 52 40.2	14 51.6	54 26.44	0.693	2.8		26	L	13 50.8	1.90
	27.0	220 28 47.7	1 22 12.0	14 49.6	54 18.89	0.562	3.3		27	U	2 13.7	1.92
	27.5	226 25 9.4	0 50 57.6	14 48.0	54 13.01	0.415	3.8		27	L	14 36.8	1.94
	28.0	232 19 57.5	−0 19 15.8	14 46.9	54 8.98	−0.254	4.3		28	U	3 0.2	1.96
	28.5	238 13 41.1	+0 12 35.0	14 46.3	54 6.97	−0.079	4.8		28	L	15 23.8	1.98
	29.0	244 6 52.1	0 44 16.5	14 46.4	54 7.13	+0.108	5.3		29	U	3 47.6	1.99
	29.5	250 0 5.0	1 15 31.4	14 47.0	54 9.59	0.303	5.8		29	L	16 11.6	2.01
	30.0	255 53 56.1	1 46 2.3	14 48.3	54 14.44	0.507	6.3		30	U	4 35.8	2.02
	30.5	261 49 3.6	+2 15 32.3	14 50.4	54 21.78	+0.717	6.8		30	L	17 0.1	2.02
Oct.	1.0	267 46 6.5	+2 43 44.1	14 53.0	54 31.65	+0.929	7.3	Oct.	1	U	5 24.4	2.03

MOON, 1919.

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d		·	h m	m
Oct. 1.0	267 46 6.5	+2 43 44.1	14 53.0	54 31.65	+0.929	7.3	Oct. 1	U	5 24.4	2.03
1.5	273 45 45.1	3 10 20.5	14 56.4	54 44.07	1.141	7.8	1	L	17 48.8	2.03
2.0	279 48 38.8	3 35 3.9	15 0.5	54 59.00	1.345	8.3	2	U	6 13.2	2.03
2.5	285 55 26.9	3 57 36.3	15 5.2	55 16.33	1.543	8.8	2	L	18 37.6	2.03
3.0	292 6 46.8	4 17 39.3	15 10.6	55 35.99	1.729	9.3	3	U	7 1.9	2.02
3.5	298 23 13.6	+4 34 53.8	15 16.5	55 57.75	+1.895	9.8	3	L	19 26.2	2.02
4.0	304 45 18.8	4 49 0.9	15 22.9	56 21.37	2.038	10.3	4	U	7 50.5	2.02
4.5	311 13 29.0	4 59 41.7	15 29.8	56 46.54	2.152	10.8	4	L	20 14.8	2.03
5.0	317 48 5.0	5 6 37.8	15 37.0	57 12.87	2.231	11.3	5	U	8 39.2	2.04
5.5	324 29 20.5	5 9 32.1	15 44.4	57 39.91	2.267	11.8	5	L	21 3.7	2.05
6.0	331 17 21.0	+5 8 9.5	15 51.8	58 7.11	+2.260	12.3	6	U	9 28.4	2.07
6.5	338 12 2.6	5 2 18.4	15 59.1	58 33.95	2.203	12.8	6	L	21 53.4	2.10
7.0	345 13 11.4	4 51 50.8	16 6.1	58 59.78	2.093	13.3	7	U	10 18.8	2.13
7.5	352 20 23.3	4 36 44.3	16 12.7	59 23.97	1.931	13.8	7	L	22 44.6	2.17
8.0	359 33 4.4	4 17 3.1	16 18.7	59 45.92	1.718	14.3	8	U	11 11.0	2.22
8.5	6 50 31.2	+3 52 57.9	16 23.9	60 5.03	+1.460	14.8	8	L	23 37.9	2.27
9.0	14 11 52.7	3 24 47.0	16 28.2	60 20.81	1.163	15.3			. . . . .	. . .
9.5	21 36 11.7	2 52 56.6	16 31.5	60 32.82	0.835	15.8	9	U	12 5.5	2.33
10.0	29 2 27.3	2 17 59.3	16 33.6	60 40.81	0.492	16.3	10	L	0 33.8	2.38
10.5	36 29 37.3	1 40 33.9	16 34.7	60 44.61	+0.143	16.8	10	U	13 2.7	2.43
11.0	43 56 40.5	+1 1 23.2	16 34.6	60 44.25	−0.201	17.3	11	L	1 32.2	2.48
11.5	51 22 39.3	+0 21 13.0	16 33.4	60 39.87	0.525	17.8	11	U	14 2.3	2.52
12.0	58 46 41.0	−0 19 10.5	16 31.2	60 31.77	0.820	18.3	12	L	2 32.6	2.54
12.5	66 8 0.1	0 59 1.9	16 28.1	60 20.32	1.081	18.8	12	U	15 3.2	2.55
13.0	73 25 58.3	1 37 38.4	16 24.2	60 6.00	1.299	19.3	13	L	3 33.7	2.53
13.5	80 40 5.3	−2 14 21.0	16 19.6	59 49.32	−1.473	19.8	13	U	16 3.9	2.50
14.0	87 49 59.1	2 48 35.5	16 14.6	59 30.81	1.606	20.3	14	L	4 33.6	2.45
14.5	94 55 24.3	3 19 52.5	16 9.2	59 10.95	1.696	20.8	14	U	17 2.7	2.39
15.0	101 56 12.5	3 47 48.1	16 3.5	58 50.26	1.747	21.3	15	L	5 31.0	2.33
15.5	108 52 20.8	4 12 3.5	15 57.8	58 29.15	1.767	21.8	15	U	17 58.5	2.26
16.0	115 43 50.8	−4 32 24.8	15 52.0	58 7.97	−1.757	22.3	16	L	6 25.2	2.19
16.5	122 30 48.0	4 48 42.5	15 46.3	57 47.07	1.724	22.8	16	U	18 51.0	2.12
17.0	129 13 20.0	5 0 51.2	15 40.7	57 26.65	1.676	23.3	17	L	7 16.0	2.05
17.5	135 51 36.6	5 8 49.3	15 35.4	57 6.91	1.613	23.8	17	U	19 40.3	1.99
18.0	142 25 48.2	5 12 38.4	15 30.2	56 47.98	1.540	24.3	18	L	8 3.9	1.94
18.5	148 56 6.4	−5 12 22.6	15 25.3	56 29.98	−1.461	24.8	18	U	20 27.0	1.91
19.0	155 22 42.2	5 8 9.2	15 20.6	56 12.93	1.381	25.3	19	L	8 49.7	1.88
19.5	161 45 46.6	5 0 7.4	15 16.3	55 56.84	1.300	25.8	19	U	21 12.1	1.85
20.0	168 5 30.3	4 48 28.7	15 12.1	55 41.74	1.217	26.3	20	L	9 34.2	1.84
20.5	174 22 3.4	4 33 26.4	15 8.3	55 27.62	1.136	26.8	20	U	21 56.2	1.83
21.0	180 35 35.8	−4 15 15.3	15 4.7	55 14.46	−1.058	27.3	21	L	10 18.1	1.83
21.5	186 46 16.7	3 54 11.8	15 1.4	55 2.23	0.979	27.8	21	U	22 40.1	1.84
22.0	192 54 15.8	3 30 33.5	14 58.3	54 50.97	0.900	28.3	22	L	11 2.2	1.84
22.5	198 59 43.0	3 4 39.1	14 55.5	54 40.64	0.821	28.8	22	U	23 24.4	1.86
23.0	205 2 48.4	2 36 47.7	14 52.9	54 31.29	0.736	29.3	23	L	11 46.9	1.88
23.5	211 3 43.4	−2 7 19.5	14 50.7	54 22.99	−0.648	0.1			. . . . .	. . .
24.0	217 2 40.0	−1 36 34.5	14 48.7	54 15.76	−0.555	0.6	24	U	0 9.6	1.90

GREENWICH MEAN TIME.

M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d				h m	m
24.0	217 2 40.0	−1 36 34.5	14 48.7	54 15.76	−0.555	0.6	Oct.	24	U	0 9.6	1.90
24.5	222 59 52.1	1 4 53.2	14 47.0	54 9.69	0.455	1.1		24	L	12 32.5	1.92
25.0	228 55 35.2	0 32 35.6	14 45.8	54 4.88	0.346	1.6		25	U	0 55.7	1.95
25.5	234 50 6.4	−0 0 1.7	14 44.8	54 1.42	0.228	2.1		25	L	13 19.2	1.96
26.0	240 43 44.7	+0 32 29.0	14 44.3	53 59.44	−0.100	2.6		26	U	1 42.8	1.98
26.5	246 36 51.8	+1 4 37.3	14 44.2	53 59.06	+0.039	3.1		26	L	14 6.7	2.00
27.0	252 29 50.8	1 36 4.8	14 44.5	54 0.42	0.190	3.6		27	U	2 30.7	2.01
27.5	258 23 7.4	2 6 33.3	14 45.4	54 3.65	0.350	4.1		27	L	14 54.8	2.01
28.0	264 17 9.3	2 35 45.4	14 46.8	54 8.86	0.521	4.6		28	U	3 18.9	2.01
28.5	270 12 26.4	3 3 24.0	14 48.8	54 16.20	0.702	5.1		28	L	15 43.0	2.01
29.0	276 9 30.0	+3 29 12.2	14 51.4	54 25.73	+0.889	5.6		29	U	4 7.1	2.00
29.5	282 8 53.4	3 52 53.6	14 54.6	54 37.57	1.083	6.1		29	L	16 31.0	1.99
30.0	288 11 10.6	4 14 11.8	14 58.5	54 51.74	1.279	6.6		30	U	4 54.8	1.98
30.5	294 16 56.7	4 32 50.5	15 3.0	55 8.27	1.475	7.1		30	L	17 18.6	1.98
31.0	300 26 46.8	4 48 33.7	15 8.2	55 27.13	1.667	7.6		31	U	5 42.2	1.97
31.5	306 41 15.4	+5 1 5.2	15 13.9	55 48.25	+1.850	8.1		31	L	18 5.8	1.97
1.0	313 0 55.9	5 10 9.3	15 20.2	56 11.48	2.019	8.6	Nov.	1	U	6 29.4	1.97
1.5	319 26 18.7	5 15 30.4	15 27.1	56 36.64	2.171	9.1		1	L	18 53.1	1.97
2.0	325 57 51.8	5 16 54.4	15 34.4	57 3.48	2.296	9.6		2	U	7 16.8	1.99
2.5	332 35 57.6	5 14 8.4	15 42.1	57 31.61	2.387	10.1		2	L	19 40.8	2.01
3.0	339 20 53.2	+5 7 1.3	15 50.0	58 0.61	+2.439	10.6		3	U	8 5.1	2.04
3.5	346 12 48.4	4 55 25.6	15 58.0	58 29.96	2.444	11.1		3	L	20 29.9	2.08
4.0	353 11 44.2	4 39 17.4	16 5.9	58 59.06	2.397	11.6		4	U	8 55.1	2.13
4.5	0 17 32.2	4 18 38.1	16 13.6	59 27.25	2.291	12.1		4	L	21 21.1	2.19
5.0	7 29 53.7	3 53 35.5	16 20.8	59 53.79	2.123	12.6		5	U	9 47.7	2.25
5.5	14 48 18.3	+3 24 24.0	16 27.4	60 17.96	+1.896	13.1		5	L	22 15.2	2.33
6.0	22 12 5.7	2 51 25.9	16 33.2	60 39.06	1.610	13.6		6	U	10 43.6	2.40
6.5	29 40 25.2	2 15 11.2	16 37.9	60 56.39	1.272	14.1		6	L	23 12.8	2.47
7.0	37 12 17.2	1 36 17.5	16 41.4	61 9.43	0.894	14.6		7	U	11 42.9	2.54
7.5	44 46 35.5	0 55 28.5	16 43.7	61 17.72	0.484	15.1				. . . . .	. . .
8.0	52 22 9.2	+0 13 32.7	16 44.6	61 21.00	+0.062	15.6		8	L	0 13.7	2.59
8.5	59 57 45.6	−0 28 38.6	16 44.1	61 19.24	−0.355	16.1		8	U	12 45.0	2.62
9.0	67 32 13.3	1 10 13.7	16 42.3	61 12.56	0.755	16.6		9	L	1 16.6	2.64
9.5	75 4 24.4	1 50 22.8	16 39.2	61 1.25	1.124	17.1		9	U	13 48.2	2.63
10.0	82 33 17.1	2 28 20.3	16 35.0	60 45.77	1.447	17.6		10	L	2 19.6	2.60
10.5	89 57 57.5	−3 3 25.9	16 29.8	60 26.72	−1.719	18.1		10	U	14 50.5	2.54
11.0	97 17 40.9	3 35 6.1	16 23.8	60 4.74	1.934	18.6		11	L	3 20.6	2.47
11.5	104 31 52.6	4 2 54.5	16 17.2	59 40.53	2.092	19.1		11	U	15 49.8	2.40
12.0	111 40 7.9	4 26 32.2	16 10.2	59 14.76	2.192	19.6		12	L	4 18.1	2.31
12.5	118 42 12.0	4 45 47.0	16 2.9	58 48.12	2.240	20.1		12	U	16 45.3	2.23
13.0	125 37 58.7	−5 0 32.6	15 55.6	58 21.18	−2.243	20.6		13	L	5 11.6	2.15
13.5	132 27 29.8	5 10 48.5	15 48.3	57 54.46	2.204	21.1		13	U	17 36.9	2.07
14.0	139 10 54.1	5 16 37.9	15 41.2	57 28.42	2.132	21.6		14	L	6 1.4	2.01
14.5	145 48 25.2	5 18 8.2	15 34.4	57 3.39	2.035	22.1		14	U	18 25.1	1.95
15.0	152 20 21.4	5 15 28.8	15 27.9	56 39.66	1.917	22.6		15	L	6 48.3	1.91
15.5	158 47 4.0	−5 8 52.0	15 21.9	56 17.43	−1.786	23.1		15	U	19 10.9	1.86
16.0	165 8 56.6	−4 58 31.2	15 16.2	55 56.83	−1.646	23.6		16	L	7 33.1	1.84

MOON, 1919.

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Nov. 16.0	165 8 56.6	−4 58 31.2	15 16.2	55 56.83	−1.646	23.6	Nov. 16	L	7 33.1	1.84
16.5	171 26 23.5	4 44 41.2	15 11.1	55 37.94	1.501	24.1	16	U	19 55.1	1.83
17.0	177 39 50.2	4 27 37.6	15 6.4	55 20.81	1.353	24.6	17	L	8 17.0	1.82
17.5	183 49 41.6	4 7 37.1	15 2.2	55 5.45	1.210	25.1	17	U	20 38.8	1.82
18.0	189 56 22.4	3 44 56.7	14 58.5	54 51.76	1.069	25.6	18	L	9 0.6	1.82
18.5	196 0 16.3	−3 19 54.0	14 55.3	54 39.77	−0.932	26.1	18	U	21 22.5	1.84
19.0	202 1 45.9	2 52 47.3	14 52.4	54 29.36	0.803	26.6	19	L	9 44.7	1.86
19.5	208 1 12.2	2 23 55.1	14 50.0	54 20.47	0.679	27.1	19	U	22 7.1	1.87
20.0	213 58 55.6	1 53 36.6	14 48.0	54 13.05	0.560	27.6	20	L	10 29.7	1.89
20.5	219 55 14.7	1 22 11.0	14 46.3	54 7.01	0.447	28.1	20	U	22 52.6	1.93
21.0	225 50 27.6	−0 49 57.8	14 45.0	54 2.30	−0.338	28.6	21	L	11 15.9	1.95
21.5	231 44 51.3	−0 17 17.1	14 44.1	53 58.89	0.232	29.1	21	U	23 39.4	1.97
22.0	237 38 42.0	+0 15 31.6	14 43.5	53 56.73	0.127	29.6			. . . . .	. . .
22.5	243 32 15.9	0 48 8.3	14 43.3	53 55.84	−0.021	0.4	22	L	12 3.2	1.99
23.0	249 25 48.8	1 20 13.5	14 43.4	53 56.23	+0.086	0.9	23	U	0 27.1	2.00
23.5	255 19 36.8	+1 51 28.0	14 43.9	53 57.92	+0.197	1.4	23	L	12 51.2	2.01
24.0	261 13 56.5	2 21 32.9	14 44.7	54 0.96	0.312	1.9	24	U	1 15.4	2.01
24.5	267 9 5.1	2 50 9.8	14 45.9	54 5.43	0.434	2.4	24	L	13 39.5	2.01
25.0	273 5 20.5	3 17 1.1	14 47.5	54 11.39	0.561	2.9	25	U	2 3.6	2.01
25.5	279 3 2.1	3 41 49.8	14 49.6	54 18.92	0.695	3.4	25	L	14 27.6	1.99
26.0	285 2 30.4	+4 4 19.4	14 52.1	54 28.11	+0.839	3.9	26	U	2 51.4	1.98
26.5	291 4 7.0	4 24 14.4	14 55.1	54 39.07	0.988	4.4	26	L	15 15.0	1.96
27.0	297 8 15.5	4 41 19.8	14 58.5	54 51.84	1.143	4.9	27	U	3 38.4	1.95
27.5	303 15 20.3	4 55 21.7	15 2.5	55 6.53	1.305	5.4	27	L	16 1.7	1.93
28.0	309 25 46.8	5 6 6.8	15 7.1	55 23.16	1.467	5.9	28	U	4 24.8	1.92
28.5	315 40 1.9	+5 13 22.6	15 12.1	55 41.73	+1.628	6.4	28	L	16 47.8	1.92
29.0	321 58 32.2	5 16 57.8	15 17.7	56 2.22	1.787	6.9	29	U	5 10.8	1.92
29.5	328 21 44.6	5 16 42.1	15 23.8	56 24.59	1.937	7.4	29	L	17 33.8	1.92
30.0	334 50 5.2	5 12 26.8	15 30.4	56 48.65	2.072	7.9	30	U	5 57.0	1.94
30.5	341 23 58.1	5 4 4.9	15 37.4	57 14.24	2.189	8.4	30	L	18 20.5	1.97
Dec. 1.0	348 3 44.9	+4 51 31.9	15 44.7	57 41.07	+2.278	8.9	Dec. 1	U	6 44.4	2.01
1.5	354 49 43.7	4 34 46.1	15 52.2	58 8.78	2.335	9.4	1	L	19 8.7	2.05
2.0	1 42 7.6	4 13 49.6	15 59.9	58 36.95	2.352	9.9	2	U	7 33.7	2.11
2.5	8 41 3.2	3 48 49.2	16 7.5	59 5.03	2.320	10.4	2	L	19 59.4	2.18
3.0	15 46 29.5	3 19 56.5	16 15.0	59 32.42	2.235	10.9	3	U	8 26.0	2.25
3.5	22 58 17.0	+2 47 29.7	16 22.1	59 58.44	+2.091	11.4	3	L	20 53.5	2.33
4.0	30 16 6.1	2 11 53.3	16 28.6	60 22.37	1.886	11.9	4	U	9 22.0	2.42
4.5	37 39 26.6	1 33 38.8	16 34.4	60 43.47	1.621	12.4	4	L	21 51.5	2.50
5.0	45 7 37.5	0 53 24.3	16 39.2	61 1.06	1.300	12.9	5	U	10 21.9	2.57
5.5	52 39 47.4	+0 11 53.5	16 42.8	61 14.48	0.931	13.4	5	L	22 53.1	2.62
6.0	60 14 55.4	−0 30 5.0	16 45.2	61 23.26	+0.525	13.9	6	U	11 24.8	2.66
6.5	67 51 53.1	1 11 39.8	16 46.2	61 27.00	+0.097	14.4	6	L	23 56.9	2.68
7.0	75 29 26.5	1 51 59.1	16 45.8	61 25.56	−0.338	14.9			. . . . .	. . .
7.5	83 6 18.9	2 30 13.3	16 44.0	61 18.93	0.763	15.4	7	U	12 29.0	2.66
8.0	90 41 14.5	3 5 36.5	16 40.9	61 7.36	1.160	15.9	8	L	1 0.7	2.62
8.5	98 13 0.4	−3 37 29.1	16 36.5	60 51.24	−1.519	16.4	8	U	13 31.9	2.57
9.0	105 40 30.4	−4 5 19.2	16 31.0	60 31.11	−1.826	16.9	9	L	2 2.2	2.49

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
Dec. 9.0	105 40 30.4	−4 5 19.2	16 31.0	60 31.11	−1.826	16.9	Dec. 9	L	2 2.2	2.49
9.5	113 2 47.3	4 28 43.0	16 24.6	60 7.66	2.073	17.4	9	U	14 31.6	2.41
10.0	120 19 4.0	4 47 25.4	16 17.5	59 41.60	2.259	17.9	10	L	2 59.9	2.31
10.5	127 28 45.1	5 1 19.0	16 9.9	59 13.70	2.382	18.4	10	U	15 27.1	2.22
11.0	134 31 27.1	5 10 23.8	16 2.0	58 44.67	2.446	18.9	11	L	3 53.3	2.14
11.5	141 26 58.2	−5 14 45.8	15 54.0	58 15.22	−2.454	19.4	11	U	16 18.6	2.07
12.0	148 15 16.7	5 14 35.3	15 46.0	57 45.97	2.414	19.9	12	L	4 43.0	2.00
12.5	154 56 30.8	5 10 6.7	15 38.2	57 17.45	2.333	20.4	12	U	17 6.7	1.95
13.0	161 30 56.5	5 1 36.6	15 30.8	56 50.11	2.217	20.9	13	L	5 29.9	1.91
13.5	167 58 56.6	4 49 23.1	15 23.7	56 24.34	2.076	21.4	13	U	17 52.5	1.87
14.0	174 20 58.7	−4 33 45.4	15 17.2	56 0.37	−1.914	21.9	14	L	6 14.8	1.85
14.5	180 37 34.0	4 15 2.6	15 11.2	55 38.46	1.738	22.4	14	U	18 36.9	1.84
15.0	186 49 16.6	3 53 34.4	15 5.9	55 18.69	1.555	22.9	15	L	6 58.9	1.83
15.5	192 56 41.5	3 29 40.1	15 1.1	55 1.16	1.366	23.4	15	U	19 20.8	1.83
16.0	199 0 24.4	3 3 38.3	14 56.9	54 45.91	1.177	23.9	16	L	7 42.9	1.85
16.5	205 1 1.0	−2 35 48.1	14 53.4	54 32.90	−0.992	24.4	16	U	20 5.1	1.86
17.0	210 59 5.7	2 6 27.8	14 50.4	54 22.08	0.811	24.9	17	L	8 27.5	1.87
17.5	216 55 11.7	1 35 55.9	14 48.1	54 13.40	0.637	25.4	17	U	20 50.1	1.90
18.0	222 49 50.4	1 4 30.7	14 46.2	54 6.74	0.474	25.9	18	L	9 13.1	1.93
18.5	228 43 31.3	0 32 30.6	14 44.9	54 1.98	0.320	26.4	18	U	21 36.3	1.95
19.0	234 36 41.2	−0 0 14.2	14 44.2	53 59.03	−0.175	26.9	19	L	9 59.9	1.98
19.5	240 29 45.1	+0 31 59.8	14 43.8	53 57.74	−0.041	27.4	19	U	22 23.7	1.99
20.0	246 23 5.2	1 3 52.5	14 43.9	53 58.00	+0.084	27.9	20	L	10 47.7	2.01
20.5	252 17 1.8	1 35 5.1	14 44.3	53 59.71	0.199	28.4	20	U	23 11.9	2.02
21.0	258 11 52.8	2 5 18.5	14 45.2	54 2.75	0.307	28.9	21	L	11 36.1	2.02
21.5	264 7 54.1	+2 34 14.1	14 46.3	54 7.05	+0.409	29.4			. . . . .	. . .
22.0	270 5 19.9	3 1 33.2	14 47.8	54 12.54	0.505	0.0	22	U	0 0.4	2.03
22.5	276 4 22.7	3 26 57.6	14 49.6	54 19.15	0.597	0.5	22	L	12 24.7	2.02
23.0	282 5 14.0	3 50 9.8	14 51.7	54 26.87	0.688	1.0	23	U	0 48.8	2.00
23.5	288 8 4.2	4 10 53.2	14 54.1	54 35.67	0.779	1.5	23	L	13 12.7	1.98
24.0	294 13 3.4	+4 28 52.0	14 56.8	54 45.57	+0.870	2.0	24	U	1 36.4	1.97
24.5	300 20 21.8	4 43 51.8	14 59.8	54 56.55	0.963	2.5	24	L	13 59.9	1.95
25.0	306 30 9.3	4 55 39.4	15 3.1	55 8.69	1.059	3.0	25	U	2 23.2	1.93
25.5	312 42 36.7	5 4 3.3	15 6.7	55 21.98	1.158	3.5	25	L	14 46.2	1.92
26.0	318 57 55.9	5 8 53.5	15 10.7	55 36.50	1.261	4.0	26	U	3 9.2	1.91
26.5	325 16 19.5	+5 10 1.8	15 15.0	55 52.25	+1.364	4.5	26	L	15 32.0	1.90
27.0	331 38 1.2	5 7 22.1	15 19.6	56 9.25	1.470	5.0	27	U	3 54.8	1.90
27.5	338 3 16.5	5 0 50.1	15 24.6	56 27.52	1.573	5.5	27	L	16 17.7	1.91
28.0	344 32 21.0	4 50 24.2	15 29.9	56 46.99	1.671	6.0	28	U	4 40.7	1.93
28.5	351 5 31.3	4 36 4.7	15 35.5	57 7.59	1.762	6.5	28	L	17 4.0	1.96
29.0	357 43 4.1	+4 17 55.2	15 41.4	57 29.22	+1.841	7.0	29	U	5 27.7	1.99
29.5	4 25 15.6	3 56 1.8	15 47.6	57 51.69	1.901	7.5	29	L	17 51.9	2.04
30.0	11 12 20.5	3 30 34.6	15 53.8	58 14.74	1.936	8.0	30	U	6 16.8	2.10
30.5	18 4 31.0	3 1 47.1	16 0.2	58 38.05	1.944	8.5	30	L	18 42.4	2.17
31.0	25 1 56.0	2 29 57.2	16 6.5	59 1.26	1.917	9.0	31	U	7 8.9	2.25
31.5	32 4 39.4	+1 55 27.6	16 12.7	59 23.88	+1.847	9.5	31	L	19 36.3	2.32
32.0	39 12 38.8	+1 18 45.6	16 18.5	59 45.40	+1.732	10.0	32	U	8 4.6	2.40

GREENWICH MEAN TIME

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Jan. 1	17 10 48.22	+ 5.040	−20 19 7.3	−23.90	9.943 4525	+4397.6	3.81	10.02	22 28.9
2	17 13 2.98	6.171	20 29 10.9	26.29	9.953 8697	4280.6	3.72	9.79	22 27.6
3	17 15 43.57	7.194	20 40 4.2	28.06	9.963 9876	4148.8	3.63	9.56	22 26.7
4	17 18 47.48	8.116	20 51 33.2	29.27	9.973 7762	4007.3	3.55	9.35	22 26.1
5	17 22 12.40	8.946	21 3 25.3	29.98	9.983 2181	3860.3	3.47	9.15	22 25.9
6	17 25 56.24	+ 9.694	−21 15 28.8	−30.24	9.992 3034	+3710.5	3.40	8.96	22 25.9
7	17 29 57.11	10.367	21 27 33.5	30.09	0.001 0281	3560.4	3.33	8.78	22 26.2
8	17 34 13.32	10.974	21 39 30.1	29.57	0.009 3943	3411.7	3.27	8.61	22 26.8
9	17 38 43.38	11.521	21 51 10.2	28.72	0.017 4064	3265.6	3.21	8.45	22 27.5
10	17 43 25.93	12.017	22 2 26.6	27.59	0.025 0721	3123.1	3.16	8.31	22 28.5
11	17 48 19.80	+12.465	−22 13 12.7	−26.21	0.032 4006	+2984.7	3.10	8.17	22 29.6
12	17 53 23.91	12.871	22 23 22.8	24.60	0.039 4022	2850.8	3.05	8.04	22 30.9
13	17 58 37.33	13.241	22 32 51.7	22.78	0.046 0880	2721.5	3.01	7.92	22 32.3
14	18 3 59.20	13.577	22 41 34.8	20.78	0.052 4693	2597.0	2.96	7.80	22 33.8
15	18 9 28.79	13.884	22 49 28.1	18.63	0.058 5576	2477.3	2.92	7.69	22 35.5
16	18 15 5.41	+14.164	−22 56 27.9	−16.33	0.064 3642	+2362.2	2.88	7.59	22 37.3
17	18 20 48.47	14.420	23 2 31.0	13.91	0.069 8998	2251.6	2.84	7.49	22 39.1
18	18 26 37.42	14.655	23 7 34.5	11.36	0.075 1755	2145.5	2.81	7.40	22 41.1
19	18 32 31.77	14.871	23 11 35.7	8.72	0.080 2012	2043.3	2.78	7.32	22 43.1
20	18 38 31.08	15.068	23 14 32.4	5.99	0.084 9864	1945.1	2.75	7.24	22 45.3
21	18 44 34.93	+15.250	−23 16 22.6	− 3.18	0.089 5408	+1850.7	2.72	7.16	22 47.5
22	18 50 42.97	15.417	23 17 4.2	− 0.28	0.093 8724	1759.7	2.69	7.09	22 49.7
23	18 56 54.86	15.571	23 16 35.4	+ 2.68	0.097 9900	1672.0	2.67	7.02	22 52.0
24	19 3 10.30	15.713	23 14 54.9	5.70	0.101 9005	1587.3	2.64	6.96	22 54.4
25	19 9 28.99	15.843	23 12 1.1	8.79	0.105 6113	1505.5	2.62	6.90	22 56.8
26	19 15 50.68	+15.963	−23 7 52.8	+11.91	0.109 1288	+1426.2	2.60	6.85	22 59.3
27	19 22 15.14	16.074	23 2 28.9	15.09	0.112 4590	1349.3	2.58	6.79	23 1.8
28	19 28 42.15	16.176	22 55 48.1	18.31	0.115 6073	1274.6	2.56	6.74	23 4.3
29	19 35 11.50	16.269	22 47 49.7	21.57	0.118 5787	1201.8	2.54	6.70	23 6.9
30	19 41 43.01	16.356	22 38 32.6	24.86	0.121 3774	1130.7	2.53	6.66	23 9.6
31	19 48 16.51	+16.435	−22 27 56.0	+28.19	0.124 0075	+1061.2	2.51	6.61	23 12.2
Feb. 1	19 54 51.83	16.508	22 15 59.3	31.54	0.126 4724	993.1	2.50	6.58	23 14.9
2	20 1 28.85	16.575	22 2 41.7	34.93	0.128 7753	926.1	2.48	6.54	23 17.6
3	20 8 7.41	16.637	21 48 2.6	38.34	0.130 9182	859.9	2.47	6.51	23 20.3
4	20 14 47.41	16.695	21 32 1.4	41.77	0.132 9035	794.5	2.46	6.48	23 23.1
5	20 21 28.72	+16.748	−21 14 37.5	+45.22	0.134 7324	+ 729.6	2.45	6.45	23 25.8
6	20 28 11.27	16.797	20 55 50.6	48.69	0.136 4060	665.1	2.44	6.43	23 28.6
7	20 34 54.95	16.843	20 35 40.1	52.19	0.137 9249	600.6	2.43	6.41	23 31.4
8	20 41 39.70	16.886	20 14 5.6	55.69	0.139 2887	535.9	2.43	6.39	23 34.3
9	20 48 25.44	16.926	19 51 6.8	59.21	0.140 4970	470.8	2.42	6.37	23 37.1
10	20 55 12.11	+16.964	−19 26 43.2	+62.75	0.141 5481	+ 405.1	2.41	6.35	23 40.0
11	21 1 59.68	17.000	19 0 54.7	66.30	0.142 4408	338.5	2.41	6.34	23 42.8
12	21 8 48.10	17.035	18 33 40.9	69.85	0.143 1717	270.4	2.40	6.33	23 45.7
13	21 15 37.33	17.068	18 5 1.8	73.41	0.143 7377	200.9	2.40	6.32	23 48.6
14	21 22 27.34	17.100	17 34 57.0	76.99	0.144 1347	129.7	2.40	6.32	23 51.5
15	21 29 18.12	+17.132	−17 3 26.5	+80.55	0.144 3583	+ 56.2	2.40	6.31	23 54.4
16	21 36 9.65	+17.162	−16 30 30.5	+84.12	0.144 4022	− 20.0	2.40	6.31	23 57.4

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
eb. 16	21 36 9.65	+17.162	−16 30 30.5	+ 84.12	0.144 4022	− 20.0	2.40	6.31	23 57.4
17	21 43 1.90	17.192	15 56 8.8	87.68	0.144 2601	99.0	2.40	6.31	. . . . .
18	21 49 54.86	17.221	15 20 21.8	91.23	0.143 9241	181.5	2.40	6.32	0 0.3
19	21 56 48.52	17.250	14 43 9.7	94.77	0.143 3857	267.8	2.40	6.33	0 3.3
20	22 3 42.85	17.278	14 4 33.0	98.28	0.142 6351	358.5	2.41	6.34	0 6.2
21	22 10 37.83	+17.304	−13 24 32.4	+101.77	0.141 6614	− 453.7	2.41	6.35	0 9.2
22	22 17 33.41	17.328	12 43 8.6	105.21	0.140 4529	554.4	2.42	6.37	0 12.2
23	22 24 29.56	17.350	12 0 22.9	108.60	0.138 9956	661.0	2.43	6.39	0 15.2
24	22 31 26.20	17.369	11 16 16.5	111.92	0.137 2750	774.0	2.44	6.42	0 18.2
25	22 38 23.24	17.383	10 30 51.3	115.16	0.135 2749	894.0	2.45	6.45	0 21.2
26	22 45 20.56	+17.392	− 9 44 9.5	+118.31	0.132 9778	−1021.6	2.46	6.48	0 24.3
27	22 52 18.01	17.393	8 56 13.6	121.33	0.130 3645	1157.5	2.48	6.52	0 27.3
28	22 59 15.37	17.385	8 7 6.9	124.20	0.127 4147	1302.2	2.49	6.56	0 30.3
ar. 1	23 6 12.40	17.365	7 16 53.4	126.89	0.124 1062	1456.3	2.51	6.61	0 33.3
2	23 13 8.76	17.330	6 25 37.7	129.38	0.120 4166	1619.9	2.53	6.67	0 36.3
3	23 20 4.09	+17.277	− 5 33 25.3	+131.61	0.116 3223	−1793.7	2.56	6.73	0 39.3
4	23 26 57.87	17.201	4 40 22.7	133.55	0.111 7984	1977.9	2.58	6.80	0 42.3
5	23 33 49.54	17.100	3 46 37.6	135.15	0.106 8205	2172.1	2.61	6.88	0 45.2
6	23 40 38.41	16.967	2 52 18.5	136.37	0.101 3646	2376.2	2.65	6.97	0 48.1
7	23 47 23.69	16.799	1 57 35.4	137.14	0.095 4073	2589.7	2.68	7.06	0 50.9
8	23 54 4.45	+16.590	− 1 2 39.5	+137.43	0.088 9274	−2811.5	2.72	7.17	0 53.6
9	0 0 39.63	16.334	− 0 7 43.2	137.17	0.081 9064	3040.4	2.77	7.29	0 56.3
10	0 7 8.05	16.026	+ 0 46 59.7	136.31	0.074 3290	3274.7	2.82	7.42	0 58.8
11	0 13 28.41	15.661	1 41 14.6	134.82	0.066 1851	3512.2	2.87	7.56	1 1.2
12	0 19 39.31	15.236	2 34 45.7	132.66	0.057 4699	3750.4	2.93	7.71	1 3.4
13	0 25 39.22	+14.745	+ 3 27 16.5	+129.79	0.048 1849	−3986.4	2.99	7.88	1 5.5
14	0 31 26.56	14.189	4 18 30.1	126.22	0.038 3394	4217.1	3.06	8.06	1 7.3
15	0 36 59.72	13.563	5 8 9.3	121.93	0.027 9498	4439.3	3.13	8.25	1 8.9
16	0 42 17.03	12.869	5 55 57.1	116.94	0.017 0405	4649.5	3.21	8.46	1 10.2
17	0 47 16.88	12.107	6 41 36.7	111.25	0.005 6445	4844.4	3.30	8.69	1 11.3
18	0 51 57.66	+11.281	+ 7 24 52.1	+104.93	9.993 8019	−5021.1	3.39	8.93	1 12.0
19	0 56 17.87	10.393	8 5 28.2	97.98	9.981 5605	5176.3	3.49	9.18	1 12.4
20	1 0 16.09	9.449	8 43 10.6	90.46	9.968 9751	5307.4	3.59	9.45	1 12.4
21	1 3 51.04	8.455	9 17 46.2	82.42	9.956 1065	5411.7	3.70	9.74	1 12.0
22	1 7 1.59	7.417	9 49 3.0	73.90	9.943 0223	5486.9	3.81	10.03	1 11.2
23	1 9 46.77	+ 6.343	+10 16 50.1	+ 64.96	9.929 7942	−5531.1	3.93	10.34	1 10.0
24	1 12 5.82	5.241	10 40 57.9	55.64	9.916 4995	5542.2	4.05	10.67	1 8.4
25	1 13 58.18	4.121	11 1 18.1	46.00	9.903 2194	5518.5	4.17	11.00	1 6.3
26	1 15 23.56	2.993	11 17 43.5	36.08	9.890 0400	5458.3	4.31	11.34	1 3.7
27	1 16 21.88	1.869	11 30 8.3	25.96	9.877 0496	5360.6	4.43	11.68	1 0.8
28	1 16 53.41	+ 0.762	+11 38 28.3	+ 15.70	9.864 3404	−5224.0	4.57	12.03	0 57.3
29	1 16 58.69	− 0.316	11 42 41.4	+ 5.39	9.852 0061	5048.0	4.70	12.37	0 53.5
30	1 16 38.61	1.349	11 42 47.2	− 4.89	9.840 1418	4832.2	4.83	12.72	0 49.2
31	1 15 54.40	2.324	11 38 48.0	15.01	9.828 8429	4577.1	4.95	13.05	0 44.5
pr. 1	1 14 47.66	3.224	11 30 48.8	24.86	9.818 2026	4283.6	5.08	13.37	0 39.5
2	1 13 20.35	− 4.036	+11 18 57.9	− 34.30	9.808 3110	−3953.6	5.19	13.68	0 34.1
3	1 11 34.76	− 4.745	+11 3 26.7	− 43.19	9.799 2523	−3590.0	5.30	13.97	0 28.4

MERCURY, 1919.

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
		h m s	s	° ′ ″	″			″	″	h m
Apr.	1	1 14 47.66	− 3.224	+11 30 48.8	−24.86	9.818 2026	−4283.6	5.08	13.37	0 39.5
	2	1 13 20.35	4.036	11 18 57.9	34.30	9.808 3110	3953.6	5.19	13.68	0 34.1
	3	1 11 34.76	4.745	11 3 26.7	43.19	9.799 2523	3590.0	5.30	13.97	0 28.4
	4	1 9 33.50	5.340	10 44 30.5	51.37	9.791 1029	3196.7	5.41	14.24	0 22.5
	5	1 7 19.43	5.811	10 22 27.9	58.70	9.783 9284	2778.2	5.49	14.47	0 16.3
	6	1 4 55.64	− 6.150	+ 9 57 41.0	−65.03	9.777 7831	−2340.1	5.57	14.68	0 10.0
	7	1 2 25.33	6.354	9 30 35.2	70.26	9.772 7062	1889.0	5.64	14.85	0 3.6 23 57.1
	8	0 59 51.73	6.423	9 1 38.1	74.30	9.768 7212	1431.3	5.69	14.99	23 50.6
	9	0 57 18.06	6.361	8 31 18.9	77.09	9.765 8356	973.9	5.73	15.09	23 44.2
	10	0 54 47.40	6.174	8 0 8.1	78.61	9.764 0408	523.5	5.75	15.15	23 37.9
	11	0 52 22.65	− 5.871	+ 7 28 35.6	−78.89	9.763 3124	− 86.2	5.76	15.18	23 31.7
	12	0 50 6.42	5.465	6 57 11.1	77.97	9.763 6119	+ 332.3	5.76	15.17	23 25.7
	13	0 48 1.03	4.970	6 26 22.0	75.95	9.764 8890	727.8	5.74	15.12	23 19.9
	14	0 46 8.48	4.398	5 56 33.7	72.92	9.767 0840	1096.6	5.71	15.05	23 14.3
	15	0 44 30.40	3.766	5 28 8.6	69.03	9.770 1293	1436.1	5.67	14.94	23 9.0
	16	0 43 8.09	− 3.086	+ 5 1 26.2	−64.39	9.773 9527	+1745.0	5.62	14.81	23 4.0
	17	0 42 2.52	2.373	4 36 42.7	59.14	9.778 4804	2022.9	5.57	14.66	22 59.2
	18	0 41 14.34	1.639	4 14 11.2	53.42	9.783 6378	2269.8	5.50	14.48	22 54.8
	19	0 40 43.95	0.892	3 54 1.6	47.33	9.789 3517	2486.9	5.43	14.29	22 50.6
	20	0 40 31.52	− 0.144	3 36 21.3	41.00	9.795 5524	2675.7	5.35	14.09	22 46.8
	21	0 40 36.99	+ 0.598	+ 3 21 14.8	−34.52	9.802 1735	+2837.6	5.27	13.88	22 43.2
	22	0 41 0.15	1.320	3 8 45.1	27.96	9.809 1533	2975.2	5.19	13.66	22 39.9
	23	0 41 40.68	2.045	2 58 52.7	21.41	9.816 4364	3090.4	5.10	13.43	22 36.9
	24	0 42 38.15	2.740	2 51 37.0	14.92	9.823 9706	3185.0	5.01	13.20	22 34.2
	25	0 43 52.02	3.413	2 46 55.8	8.53	9.831 7101	3261.7	4.92	12.97	22 31.8
	26	0 45 21.77	+ 4.062	+ 2 44 46.4	− 2.28	9.839 6140	+3322.3	4.83	12.73	22 29.6
	27	0 47 6.79	4.686	2 45 5.0	+ 3.80	9.847 6459	3368.8	4.75	12.50	22 27.6
	28	0 49 6.48	5.285	2 47 47.5	9.71	9.855 7744	3403.0	4.66	12.27	22 25.9
	29	0 51 20.26	5.859	2 52 49.3	15.41	9.863 9715	3426.4	4.57	12.04	22 24.4
	30	0 53 47.54	6.410	3 0 5.5	20.91	9.872 2135	3440.5	4.48	11.81	22 23.1
May	1	0 56 27.76	+ 6.938	+ 3 9 31.2	+26.20	9.880 4795	+3446.6	4.40	11.59	22 22.0
	2	0 59 20.39	7.444	3 21 1.3	31.28	9.888 7518	3445.9	4.32	11.37	22 21.1
	3	1 2 24.93	7.931	3 34 31.0	36.15	9.897 0153	3439.4	4.24	11.16	22 20.4
	4	1 5 40.92	8.399	3 49 55.1	40.82	9.905 2571	3428.0	4.16	10.95	22 19.9
	5	1 9 7.96	8.851	4 7 8.9	45.30	9.913 4660	3412.1	4.08	10.74	22 19.6
	6	1 12 45.66	+ 9.288	+ 4 26 7.7	+49.57	9.921 6322	+3392.6	4.00	10.54	22 19.5
	7	1 16 33.67	9.712	4 46 46.6	53.64	9.929 7479	3369.9	3.93	10.35	22 19.5
	8	1 20 31.73	10.125	5 9 1.2	57.54	9.937 8054	3344.3	3.86	10.16	22 19.6
	9	1 24 39.57	10.527	5 32 47.2	61.26	9.945 7985	3316.3	3.79	9.97	22 20.0
	10	1 28 56.98	10.922	5 58 0.1	64.79	9.953 7218	3286.0	3.72	9.79	22 20.5
	11	1 33 23.79	+11.311	+ 6 24 35.8	+68.15	9.961 5696	+3253.6	3.65	9.61	22 21.1
	12	1 37 59.88	11.695	6 52 30.1	71.34	9.969 3375	3219.3	3.58	9.44	22 21.9
	13	1 42 45.14	12.076	7 21 38.9	74.36	9.977 0204	3182.8	3.52	9.28	22 22.9
	14	1 47 39.54	12.457	7 51 58.1	77.21	9.984 6136	3144.5	3.46	9.12	22 24.0
	15	1 52 43.05	12.836	8 23 23.8	79.90	9.992 1126	3104.3	3.40	8.96	22 25.2
	16	1 57 55.69	+13.218	+ 8 55 51.9	+82.42	9.999 5123	+3061.8	3.35	8.81	22 26.7
	17	2 3 17.52	+13.602	+ 9 29 18.5	+84.76	0.006 8075	+3017.1	3.29	8.66	22 28.2

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
		h m s	s	° ′ ″	″			″	″	h m
May	17	2 3 17.52	+13.602	+ 9 29 18.5	+84.76	0.006 8075	+3017.1	3.29	8.66	22 28.2
	18	2 8 48.62	13.991	10 3 39.2	86.94	0.013 9921	2969.7	3.24	8.52	22 29.9
	19	2 14 29.12	14.385	10 38 50.0	88.93	0.021 0598	2919.6	3.18	8.38	22 31.8
	20	2 20 19.16	14.786	11 14 46.4	90.74	0.028 0036	2866.3	3.13	8.25	22 33.9
	21	2 26 18.92	15.195	11 51 23.9	92.35	0.034 8153	2809.6	3.08	8.12	22 36.1
	22	2 32 28.60	+15.613	+12 28 37.8	+93.77	0.041 4863	+2748.9	3.04	8.00	22 38.5
	23	2 38 48.41	16.040	13 6 23.0	94.96	0.048 0063	2683.8	2.99	7.88	22 41.0
	24	2 45 18.59	16.477	13 44 34.1	95.92	0.054 3645	2613.9	2.95	7.77	22 43.8
	25	2 51 59.39	16.924	14 23 5.3	96.64	0.060 5484	2538.4	2.91	7.66	22 46.7
	26	2 58 51.04	17.382	15 1 50.6	97.09	0.066 5441	2457.0	2.87	7.55	22 49.8
	27	3 5 53.80	+17.849	+15 40 43.1	+97.24	0.072 3366	+2369.0	2.83	7.45	22 53.1
	28	3 13 7.86	18.325	16 19 35.7	97.09	0.077 9095	2273.8	2.79	7.35	22 56.5
	29	3 20 33.45	18.808	16 58 20.5	96.59	0.083 2445	2170.8	2.76	7.27	23 0.2
	30	3 28 10.69	19.296	17 36 48.9	95.72	0.088 3227	2059.4	2.73	7.18	23 4.1
	31	3 35 59.70	19.788	18 14 51.8	94.46	0.093 1226	1939.1	2.70	7.10	23 8.2
June	1	3 44 0.48	+20.277	+18 52 19.4	+92.77	0.097 6232	+1809.7	2.67	7.03	23 12.4
	2	3 52 12.95	20.761	19 29 1.0	90.62	0.101 8013	1670.6	2.64	6.96	23 16.9
	3	4 0 36.93	21.235	20 4 45.5	88.01	0.105 6343	1521.9	2.62	6.90	23 21.6
	4	4 9 12.09	21.692	20 39 21.3	84.89	0.109 0988	1363.7	2.60	6.85	23 26.4
	5	4 17 57.96	22.126	21 12 36.1	81.26	0.112 1726	1196.3	2.58	6.80	23 31.4
	6	4 26 53.90	+22.530	+21 44 17.9	+77.13	0.114 8342	+1020.4	2.57	6.76	23 36.6
	7	4 35 59.10	22.896	22 14 14.2	72.48	0.117 0647	837.0	2.55	6.72	23 41.9
	8	4 45 12.56	23.218	22 42 13.2	67.36	0.118 8470	647.4	2.54	6.69	23 47.3
	9	4 54 33.17	23.489	23 8 3.6	61.77	0.120 1683	453.0	2.53	6.67	23 52.8
	10	5 3 59.60	23.704	23 31 34.8	55.77	0.121 0192	255.7	2.53	6.66	23 58.4
	11	5 13 30.46	+23.857	+23 52 37.7	+49.42	0.121 3949	+ 57.4	2.53	6.65	. . . . .
	12	5 23 4.23	23.946	24 11 4.5	42.78	0.121 2952	− 140.2	2.53	6.65	0 4.0
	13	5 32 39.34	23.969	24 26 49.3	35.92	0.120 7243	334.9	2.53	6.66	0 9.7
	14	5 42 14.22	23.927	24 39 47.6	28.92	0.119 6914	525.0	2.54	6.68	0 15.4
	15	5 51 47.32	23.821	24 49 57.1	21.86	0.118 2090	709.1	2.54	6.70	0 21.0
	16	6 1 17.14	+23.654	+24 57 17.1	+14.81	0.116 2939	− 885.6	2.56	6.73	0 26.6
	17	6 10 42.28	23.432	25 1 48.6	7.84	0.113 9648	1053.8	2.57	6.77	0 32.1
	18	6 20 1.46	23.158	25 3 34.4	+ 1.01	0.111 2429	1212.9	2.59	6.81	0 37.5
	19	6 29 13.51	22.839	25 2 38.5	− 5.63	0.108 1507	1362.4	2.61	6.86	0 42.7
	20	6 38 17.40	22.479	24 59 5.9	12.04	0.104 7113	1502.1	2.62	6.91	0 47.9
	21	6 47 12.26	+22.087	+24 53 2.7	−18.18	0.100 9481	−1632.3	2.65	6.98	0 52.9
	22	6 55 57.35	21.666	24 44 35.8	24.02	0.096 8837	1753.2	2.67	7.04	0 57.7
	23	7 4 32.03	21.221	24 33 52.3	29.55	0.092 5400	1865.1	2.70	7.11	1 2.3
	24	7 12 55.83	20.759	24 21 0.0	34.75	0.087 9380	1968.6	2.73	7.19	1 6.8
	25	7 21 8.33	20.281	24 6 6.7	39.63	0.083 0970	2064.2	2.76	7.27	1 11.0
	26	7 29 9.25	+19.794	+23 49 20.3	−44.18	0.078 0357	−2152.5	2.79	7.35	1 15.1
	27	7 36 58.36	19.298	23 30 48.6	48.40	0.072 7703	2234.3	2.83	7.44	1 19.0
	28	7 44 35.51	18.797	23 10 39.6	52.30	0.067 3160	2309.9	2.86	7.54	1 22.7
	29	7 52 0.61	18.294	22 49 0.8	55.88	0.061 6869	2380.2	2.90	7.63	1 26.1
	30	7 59 13.61	17.789	22 25 59.7	59.16	0.055 8948	2445.6	2.94	7.74	1 29.4
July	1	8 6 14.49	+17.284	+22 1 43.6	−62.14	0.049 9515	−2506.5	2.98	7.84	1 32.5
	2	8 13 3.26	+16.780	+21 36 19.5	−64.83	0.043 8664	−2563.7	3.02	7.95	1 35.[illegible]

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Oct. 1	12 40 7.75	+15.580	– 3 13 35.3	–115.45	0.149 5193	+ 290.0	2.37	6.24	0 3.5
2	12 46 20.29	15.466	3 59 35.1	114.52	0.150 1095	202.4	2.37	6.23	0 5.7
3	12 52 30.16	15.358	4 45 11.5	113.50	0.150 4940	118.6	2.36	6.22	0 8.0
4	12 58 37.54	15.258	5 30 22.3	112.39	0.150 6814	+ 37.9	2.36	6.22	0 10.1
5	13 4 42.59	15.165	6 15 5.4	111.19	0.150 6780	– 40.1	2.36	6.22	0 12.3
6	13 10 45.51	+15.079	– 6 59 18.8	–109.92	0.150 4907	– 115.7	2.36	6.22	0 14.4
7	13 16 46.45	15.001	7 43 0.8	108.57	0.150 1244	189.2	2.37	6.23	0 16.5
8	13 22 45.59	14.929	8 26 9.8	107.17	0.149 5841	260.0	2.37	6.24	0 18.5
9	13 28 43.08	14.863	9 8 44.3	105.70	0.148 8733	331.2	2.37	6.25	0 20.5
10	13 34 39.09	14.805	9 50 42.8	104.17	0.147 9951	400.4	2.38	6.26	0 22.5
11	13 40 33.77	+14.752	–10 32 3.9	–102.58	0.146 9522	– 468.7	2.38	6.27	0 24.5
12	13 46 27.25	14.705	11 12 46.3	100.94	0.145 7459	536.4	2.39	6.29	0 26.4
13	13 52 19.68	14.664	11 52 48.8	99.26	0.144 3776	603.8	2.40	6.31	0 28.4
14	13 58 11.18	14.628	12 32 10.2	97.52	0.142 8476	671.2	2.41	6.33	0 30.3
15	14 4 1.85	14.596	13 10 49.1	95.72	0.141 1558	738.8	2.42	6.36	0 32.2
16	14 9 51.81	+14.568	–13 48 44.4	– 93.88	0.139 3017	– 806.5	2.43	6.39	0 34.1
17	14 15 41.13	14.543	14 25 54.9	91.99	0.137 2841	874.9	2.43	6.41	0 36.0
18	14 21 29.89	14.521	15 2 19.3	90.04	0.135 1014	944.2	2.45	6.45	0 37.8
19	14 27 18.16	14.501	15 37 56.4	88.04	0.132 7510	1014.6	2.46	6.48	0 39.7
20	14 33 5.97	14.483	16 12 45.0	86.00	0.130 2306	1085.9	2.48	6.52	0 41.6
21	14 38 53.36	+14.466	–16 46 43.8	– 83.89	0.127 5372	–1159.0	2.49	6.56	0 43.4
22	14 44 40.33	14.448	17 19 51.5	81.74	0.124 6662	1233.8	2.51	6.60	0 45.3
23	14 50 26.86	14.429	17 52 6.7	79.52	0.121 6145	1310.0	2.53	6.65	0 47.1
24	14 56 12.94	14.410	18 23 28.1	77.25	0.118 3766	1388.5	2.54	6.70	0 48.9
25	15 1 58.50	14.387	18 53 54.3	74.92	0.114 9477	1469.3	2.56	6.75	0 50.7
26	15 7 43.46	+14.359	–19 23 23.8	– 72.53	0.111 3217	–1552.7	2.59	6.81	0 52.6
27	15 13 27.70	14.327	19 51 55.2	70.07	0.107 4926	1638.7	2.61	6.87	0 54.3
28	15 19 11.10	14.288	20 19 26.8	67.55	0.103 4533	1727.8	2.63	6.93	0 56.1
29	15 24 53.45	14.241	20 45 57.0	64.96	0.099 1965	1820.0	2.66	7.00	0 57.9
30	15 30 34.57	14.184	21 11 24.3	62.30	0.094 7144	1915.7	2.69	7.08	0 59.6
31	15 36 14.16	+14.114	–21 35 46.9	– 59.57	0.089 9981	–2015.1	2.72	7.15	1 1.4
Nov. 1	15 41 51.92	14.030	21 59 3.0	56.76	0.085 0389	2118.3	2.75	7.23	1 3.0
2	15 47 27.49	13.931	22 21 10.7	53.87	0.079 8268	2225.7	2.78	7.32	1 4.7
3	15 53 0.44	13.812	22 42 8.2	50.91	0.074 3520	2337.4	2.81	7.41	1 6.3
4	15 58 30.27	13.670	23 1 53.5	47.86	0.068 6036	2453.7	2.85	7.51	1 7.9
5	16 3 56.40	+13.503	–23 20 24.6	– 44.72	0.062 5706	–2574.6	2.89	7.62	1 9.3
6	16 9 18.18	13.306	23 37 39.2	41.49	0.056 2418	2700.3	2.94	7.73	1 10.8
7	16 14 34.84	13.076	23 53 35.3	38.17	0.049 6053	2830.9	2.98	7.85	1 12.1
8	16 19 45.52	12.807	24 8 10.6	34.75	0.042 6495	2966.4	3.03	7.98	1 13.3
9	16 24 49.24	12.494	24 21 22.7	31.24	0.035 3627	3106.7	3.08	8.11	1 14.4
10	16 29 44.84	+12.130	–24 33 9.2	– 27.62	0.027 7339	–3251.4	3.14	8.26	1 15.4
11	16 34 31.05	11.711	24 43 27.5	23.89	0.019 7526	3400.3	3.19	8.41	1 16.2
12	16 39 6.43	11.226	24 52 14.9	20.04	0.011 4100	3552.4	3.25	8.57	1 16.9
13	16 43 29.31	10.668	24 59 28.6	16.08	0.002 6992	3706.9	3.32	8.75	1 17.3
14	16 47 37.85	10.029	25 5 5.6	11.98	9.993 6162	3862.2	3.39	8.93	1 17.5
15	16 51 29.97	+ 9.298	–25 9 2.7	– 7.75	9.984 1615	–4016.4	3.47	9.13	1 17.4
16	16 55 3.34	+ 8.465	–25 11 16.4	– 3.37	9.974 3406	–4166.6	3.55	9.34	1 17.0

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension. Noon.	Var. per Hour. Noon.	Apparent Declination. Noon.	Var. per Hour. Noon.	Logarithm of Distance from Earth. Noon.	Var. per Hour. Noon.	Semi-diameter. Noon.	Hor. Parallax. Noon.	Transit, Meridian of Greenwich.
		h m s	s	° ′ ″	″			″	″	h m
Nov.	16	16 55 3.34	+ 8.465	−25 11 16.4	− 3.37	9.974 3406	−4166.6	3.55	9.34	1 17.0
	17	16 58 15.42	7.522	25 11 43.0	+ 1.18	9.964 1676	4309.5	3.63	9.56	1 16.2
	18	17 1 3.40	6.456	25 10 18.2	5.91	9.953 6644	4440.6	3.72	9.79	1 15.1
	19	17 3 24.25	5.260	25 6 57.7	10.84	9.942 8670	4553.8	3.81	10.04	1 13.4
	20	17 5 14.78	3.927	25 1 36.2	15.99	9.931 8258	4642.4	3.91	10.30	1 11.3
	21	17 6 31.65	+ 2.454	−24 54 8.3	+21.37	9.920 6104	−4697.4	4.01	10.57	1 8.6
	22	17 7 11.55	+ 0.847	24 44 28.1	27.02	9.909 3136	4708.4	4.12	10.84	1 5.3
	23	17 7 11.32	− 0.886	24 32 29.1	32.94	9.898 0546	4663.8	4.23	11.13	1 1.4
	24	17 6 28.17	2.724	24 18 5.2	39.09	9.886 9822	4550.8	4.34	11.42	0 56.7
	25	17 5 0.01	4.630	24 1 11.0	45.45	9.876 2766	4355.7	4.44	11.70	0 51.3
	26	17 2 45.76	− 6.555	−23 41 42.7	+51.91	9.866 1509	−4065.8	4.55	11.98	0 45.1
	27	16 59 45.75	8.431	23 19 39.7	58.31	9.856 8448	3671.2	4.65	12.24	0 38.2
	28	16 56 2.10	10.178	22 55 6.3	64.40	9.848 6174	3166.4	4.73	12.47	0 30.5
	29	16 51 38.99	11.704	22 28 13.7	69.84	9.841 7337	2552.5	4.81	12.67	0 22.2
	30	16 46 42.82	12.917	21 59 22.2	74.24	9.836 4450	1839.6	4.87	12.82	0 13.4
Dec.	1	16 41 22.11	−13.737	−21 29 2.0	+77.17	9.832 9673	−1047.4	4.91	12.93	0 4.2 23 54.7
	2	16 35 47.06	14.104	20 57 53.2	78.23	9.831 4584	− 204.2	4.92	12.97	23 45.2
	3	16 30 8.95	13.992	20 26 44.3	77.14	9.831 9999	+ 655.1	4.92	12.96	23 35.8
	4	16 24 39.23	13.409	19 56 28.7	73.78	9.834 5857	1493.2	4.89	12.88	23 26.7
	5	16 19 28.71	12.402	19 28 0.1	68.26	9.839 1224	2275.6	4.84	12.75	23 18.1
	6	16 14 46.75	−11.043	−19 2 7.6	+60.83	9.845 4412	+2974.0	4.77	12.56	23 10.1
	7	16 10 40.74	9.421	18 39 32.2	51.92	9.853 3142	3568.5	4.69	12.34	23 2.8
	8	16 7 15.91	7.628	18 20 43.3	42.04	9.862 4796	4050.2	4.59	12.08	22 56.2
	9	16 4 35.30	5.749	18 5 58.2	31.68	9.872 6637	4417.9	4.48	11.80	22 50.3
	10	16 2 40.07	3.857	17 55 22.6	21.31	9.883 5995	4678.2	4.37	11.50	22 45.1
	11	16 1 29.78	− 2.011	−17 48 52.2	+11.31	9.895 0416	+4841.9	4.26	11.21	22 40.7
	12	16 1 2.84	− 0.251	17 46 14.8	+ 1.93	9.906 7741	4922.6	4.14	10.91	22 37.0
	13	16 1 16.85	+ 1.398	17 47 12.8	− 6.62	9.918 6148	4934.4	4.03	10.61	22 33.9
	14	16 2 8.95	2.921	17 51 25.1	14.25	9.930 4149	4891.0	3.92	10.33	22 31.4
	15	16 3 36.02	4.313	17 58 28.9	20.91	9.942 0572	4804.7	3.82	10.06	22 29.4
	16	16 5 34.93	+ 5.575	−18 8 1.0	−26.61	9.953 4517	+4686.3	3.72	9.80	22 27.9
	17	16 8 2.62	6.713	18 19 38.8	31.39	9.964 5329	4544.8	3.63	9.55	22 26.8
	18	16 10 56.20	7.734	18 33 0.9	35.31	9.975 2540	4387.4	3.54	9.32	22 26.1
	19	16 14 13.00	8.649	18 47 47.4	38.44	9.985 5847	4220.3	3.46	9.10	22 25.8
	20	16 17 50.60	9.468	19 3 40.1	40.84	9.995 5070	4047.6	3.38	8.89	22 25.7
	21	16 21 46.79	+10.201	−19 20 22.7	−42.60	0.005 0118	+3873.0	3.30	8.70	22 26.0
	22	16 25 59.62	10.856	19 37 40.3	43.77	0.014 0982	3699.3	3.24	8.52	22 26.5
	23	16 30 27.35	11.444	19 55 19.8	44.44	0.022 7704	3528.1	3.17	8.35	22 27.2
	24	16 35 8.46	11.972	20 13 9.8	44.65	0.031 0361	3360.8	3.11	8.19	22 28.2
	25	16 40 1.57	12.446	20 30 59.7	44.45	0.038 9062	3198.5	3.06	8.05	22 29.3
	26	16 45 5.50	+12.874	−20 48 40.5	−43.90	0.046 3933	+3041.6	3.00	7.91	22 30.6
	27	16 50 19.21	13.262	21 6 4.3	43.03	0.053 5108	2890.7	2.95	7.78	22 32.0
	28	16 55 41.77	13.613	21 23 3.8	41.88	0.060 2735	2745.8	2.91	7.67	22 33.5
	29	17 1 12.36	13.932	21 39 32.8	40.49	0.066 6953	2606.8	2.87	7.55	22 35.2
	30	17 6 50.28	14.223	21 55 25.7	38.88	0.072 7908	2473.7	2.83	7.44	22 37.0
	31	17 12 34.89	+14.490	−22 10 37.6	−37.08	0.078 5737	+2346.3	2.79	7.34	22 38.9
	32	17 18 25.64	. . . .	−22 25 4.0	. . .	0.084 0579	. . . .	2.75	7.25	22 40.

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Jan.	1	162 32 59.4	4 30 29.2	− 9 53.3	+6 20 36.7	−13 57.8	9.563 1635	+68831
	2	166 59 7.7	4 21 51.1	11 2.3	6 5 44.9	15 43.0	9.570 0034	67903
	3	171 16 49.5	4 13 36.5	11 54.2	5 49 16.1	17 12.1	9.576 7323	66621
	4	175 26 29.0	4 5 46.7	12 29.2	5 31 25.6	18 26.7	9.583 3176	65040
	5	179 28 31.5	3 58 22.6	12 48.1	5 12 27.1	19 28.3	9.589 7320	63211
	6	183 23 22.9	3 51 24.6	−12 51.9	+4 52 32.9	−20 18.5	9.595 9530	+61179
	7	187 11 29.2	3 44 52.2	12 41.9	4 31 53.7	20 58.4	9.601 9623	58983
	8	190 53 15.8	3 38 45.3	12 19.2	4 10 39.1	21 29.5	9.607 7452	56655
	9	194 29 8.0	3 33 3.2	11 45.4	3 48 57.3	21 52.8	9.613 2898	54222
	10	197 59 30.1	3 27 44.9	11 1.6	3 26 55.7	22 9.4	9.618 5870	51710
	11	201 24 45.5	3 22 49.7	−10 9.3	+3 4 40.4	−22 20.2	9.623 6297	+49136
	12	204 45 17.0	3 18 16.9	9 9.8	2 42 16.9	22 26.0	9.628 4127	46516
	13	208 1 26.3	3 14 5.1	8 4.2	2 19 49.8	22 27.5	9.632 9320	43868
	14	211 13 34.0	3 10 13.6	6 53.9	1 57 23.1	22 25.2	9.637 1855	41197
	15	214 22 0.0	3 6 41.6	5 39.8	1 35 0.5	22 19.6	9.641 1709	38513
	16	217 27 3.3	3 3 28.0	− 4 23.1	+1 12 44.7	−22 11.4	9.644 8880	+35826
	17	220 29 1.9	3 0 32.2	3 4.6	0 50 38.4	22 0.7	9.648 3361	33137
	18	223 28 13.1	2 57 53.1	1 45.2	0 28 43.9	21 48.0	9.651 5156	30454
	19	226 24 53.4	2 55 30.2	− 0 25.9	+0 7 3.1	21 33.3	9.654 4271	27776
	20	229 19 18.7	2 53 22.9	+ 0 52.7	−0 14 22.2	21 17.1	9.657 0711	25107
	21	232 11 44.2	2 51 30.5	+ 2 9.9	−0 35 30.6	−20 59.5	9.659 4488	+22448
	22	235 2 24.6	2 49 52.6	3 25.0	0 56 20.8	20 40.5	9.661 5610	19799
	23	237 51 34.1	2 48 28.5	4 37.4	1 16 51.3	20 20.4	9.663 4089	17159
	24	240 39 26.2	2 47 18.0	5 46.6	1 37 1.2	19 59.1	9.664 9932	14530
	25	243 26 14.6	2 46 20.8	6 52.1	1 56 49.2	19 36.8	9.666 3151	11908
	26	246 12 12.0	2 45 36.2	+ 7 53.3	−2 16 14.4	−19 13.4	9.667 3751	+ 9294
	27	248 57 31.3	2 45 4.4	8 49.9	2 35 15.7	18 49.0	9.668 1741	6687
	28	251 42 24.9	2 44 44.9	9 41.4	2 53 52.1	18 23.6	9.668 7126	4084
	29	254 27 5.3	2 44 37.9	10 27.5	3 12 2.5	17 57.0	9.668 9909	+ 1482
	30	257 11 44.8	2 44 43.1	11 7.7	3 29 45.7	17 29.3	9.669 0091	− 1118
	31	259 56 35.5	2 45 0.4	+11 41.9	−3 47 0.7	−17 0.5	9.668 7673	− 3717
Feb.	1	262 41 49.6	2 45 29.9	12 9.6	4 3 46.2	16 30.2	9.668 2655	6321
	2	265 27 39.4	2 46 11.7	12 30.6	4 20 0.7	15 58.5	9.667 5030	8929
	3	268 14 17.2	2 47 5.9	12 44.7	4 35 42.8	15 25.4	9.666 4796	11542
	4	271 1 55.5	2 48 12.9	12 51.6	4 50 50.9	14 50.6	9.665 1944	14162
	5	273 50 47.2	2 49 32.5	+12 51.2	−5 5 23.3	−14 13.9	9.663 6469	−16790
	6	276 41 4.9	2 51 5.2	12 43.2	5 19 17.9	13 35.0	9.661 8360	19428
	7	279 33 2.1	2 52 51.5	12 27.5	5 32 32.5	12 53.9	9.659 7609	22076
	8	282 26 52.4	2 54 51.4	12 4.1	5 45 4.9	12 10.4	9.657 4205	24734
	9	285 22 49.6	2 57 5.5	11 32.9	5 56 52.4	11 24.1	9.654 8137	27402
	10	288 21 8.3	2 59 34.4	+10 54.0	−6 7 52.1	−10 34.8	9.651 9398	−30077
	11	291 22 3.4	3 2 18.4	10 7.3	6 18 0.8	9 42.1	9.648 7980	32761
	12	294 25 50.4	3 5 18.3	9 13.0	6 27 15.0	8 45.6	9.645 3875	35450
	13	297 32 45.4	3 8 34.5	8 11.4	6 35 30.7	7 45.2	9.641 7081	38137
	14	300 43 5.0	3 12 7.7	7 2.8	6 42 43.9	6 40.3	9.637 7602	40821
	15	303 57 6.7	3 15 58.6	+ 5 47.5	−6 48 49.7	− 5 30.5	9.633 5443	−43493
	16	307 15 8.4	3 20 7.9	+ 4 26.3	−6 53 43.2	− 4 15.5	9.629 0623	−46145

FOR GREENWICH MEAN NOON.

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		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
eb.	16	307 15 8.4	3 20 7.9	+ 4 26.3	−6 53 43.2	− 4 15.5	9.629 0623	−46145
	17	310 37 28.9	3 24 36.4	2 59.6	6 57 18.7	2 54.6	9.624 3162	48770
	18	314 4 27.8	3 29 24.7	+ 1 28.4	6 59 30.3	− 1 27.5	9.619 3097	51352
	19	317 36 25.2	3 34 33.5	− 0 6.3	7 0 11.4	+ 0 6.4	9.614 0478	53875
	20	321 13 41.9	3 40 3.5	1 43.2	6 59 15.1	1 47.4	9.608 5373	56321
	21	324 56 39.4	3 45 55.1	− 3 21.0	−6 56 34.0	+ 3 36.1	9.602 7870	−58665
	22	328 45 39.6	3 52 9.0	4 57.9	6 52 0.1	5 33.1	9.596 8086	60881
	23	332 41 5.0	3 58 45.5	6 32.1	6 45 25.1	7 38.3	9.590 6162	62936
	24	336 43 18.1	4 5 44.4	8 1.4	6 36 40.6	9 52.1	9.584 2279	64794
	25	340 52 41.2	4 13 5.6	9 23.5	6 25 38.0	12 14.6	9.577 6653	66415
	26	345 9 36.6	4 20 48.7	−10 35.7	−6 12 8.5	+14 45.7	9.570 9546	−67744
	27	349 34 25.4	4 28 52.3	11 35.4	5 56 3.9	17 24.8	9.564 1281	68724
	28	354 7 27.6	4 37 15.1	12 19.7	5 37 16.6	20 11.0	9.557 2233	69299
ar.	1	358 49 1.3	4 45 54.8	12 46.0	5 15 40.0	23 3.1	9.550 2840	69401
	2	3 39 21.8	4 54 48.1	12 51.7	4 51 9.1	25 59.2	9.543 3612	68957
	3	8 38 40.8	5 3 51.2	−12 34.5	−4 23 41.1	+28 56.9	9.536 5131	−67896
	4	13 47 5.9	5 12 59.2	11 52.9	3 53 15.9	31 52.9	9.529 8051	66141
	5	19 4 38.7	5 22 5.7	10 46.0	3 19 57.2	34 43.2	9.523 3100	63630
	6	24 31 14.4	5 31 3.7	9 14.2	2 43 52.8	37 23.4	9.517 1063	60303
	7	30 6 40.4	5 39 44.8	7 19.1	2 5 15.5	39 48.1	9.511 2781	56116
	8	35 50 35.2	5 47 59.6	− 5 3.6	−1 24 23.6	+41 51.6	9.505 9124	−51051
	9	41 42 27.5	5 55 38.0	− 2 32.3	−0 41 41.3	43 28.0	9.501 0971	45111
	10	47 41 35.6	6 2 29.5	+ 0 8.6	+0 2 21.5	44 31.7	9.496 9178	38342
	11	53 47 7.3	6 8 23.5	2 52.0	0 47 9.5	44 57.7	9.493 4538	30820
	12	59 57 59.9	6 13 9.6	5 29.8	1 32 3.1	44 42.3	9.490 7754	22653
	13	66 13 0.9	6 16 39.0	+ 7 53.5	+2 16 19.5	+43 43.2	9.488 9394	−14000
	14	72 30 49.9	6 18 44.5	9 55.5	2 59 14.8	42 0.2	9.487 9858	− 5034
	15	78 50 0.3	6 19 21.1	11 28.8	3 40 5.8	39 35.2	9.487 9364	+ 4046
	16	85 9 1.8	6 18 26.7	12 28.6	4 18 12.5	36 32.3	9.488 7920	13033
	17	91 26 23.6	6 16 2.1	12 52.0	4 52 59.6	32 57.1	9.490 5333	21731
	18	97 40 37.0	6 12 10.7	+12 38.6	+5 23 58.2	+28 56.6	9.493 1224	+29958
	19	103 50 18.4	6 6 59.5	11 50.3	5 50 47.0	24 38.8	9.496 5039	37558
	20	109 54 12.2	6 0 37.0	10 30.8	6 13 12.7	20 11.7	9.500 6092	44416
	21	115 51 12.1	5 53 13.5	8 45.7	6 31 9.8	15 42.7	9.505 3594	50446
	22	121 40 22.7	5 45 0.4	6 41.1	6 44 39.8	11 18.6	9.510 6693	55606
	23	127 21 0.3	5 36 9.4	+ 4 23.8	+6 53 50.6	+ 7 5.0	9.516 4513	+59888
	24	132 52 32.6	5 26 51.7	+ 2 0.3	6 58 54.8	+ 3 6.1	9.522 6181	63307
	25	138 14 38.3	5 17 17.9	− 0 23.4	7 0 8.8	− 0 35.0	9.529 0853	65906
	26	143 27 6.2	5 7 37.5	2 42.0	6 57 51.3	3 56.6	9.535 7737	67737
	27	148 29 53.8	4 57 58.6	4 51.4	6 52 22.5	6 57.7	9.542 6095	68871
	28	153 23 6.1	4 48 28.0	− 6 48.2	+6 44 2.8	− 9 38.4	9.549 5271	+69380
	29	158 6 54.3	4 39 11.2	8 30.1	6 33 12.4	11 59.2	9.556 4671	69335
	30	162 41 34.6	4 30 12.7	9 55.7	6 20 10.6	14 1.4	9.563 3781	68809
	31	167 7 26.7	4 21 35.3	11 4.2	6 5 15.5	15 46.0	9.570 2151	67868
pr.	1	171 24 53.1	4 13 21.4	11 55.5	5 48 44.0	17 14.5	9.576 9399	66574
	2	175 34 17.9	4 5 32.5	−12 30.0	+5 30 51.2	−18 28.8	9.583 5200	+64984
	3	179 36 6.7	3 58 9.3	−12 48.4	+5 11 50.7	−19 30.1	9.589 9286	+63150

FOR GREENWICH MEAN NOON.

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	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Apr. 1	171 24 53.1	4 13 21.4	−11 55.5	+5 48 44.0	−17 14.5	9.576 9399	+66574
2	175 34 17.9	4 5 32.5	12 30.0	5 30 51.2	18 28.8	9.583 5200	64984
3	179 36 6.7	3 58 9.3	12 48.4	5 11 50.7	19 30.1	9.589 9286	63150
4	183 30 45.1	3 51 11.9	12 51.8	4 51 54.9	20 19.8	9.596 1432	61113
5	187 18 39.1	3 44 40.4	12 41.4	4 31 14.5	20 59.5	9.602 1458	58913
6	191 0 14.4	3 38 34.3	−12 18.4	+4 9 58.9	−21 30.3	9.607 9214	+56580
7	194 35 55.9	3 32 52.9	11 44.2	3 48 16.5	21 53.4	9.613 4584	54145
8	198 6 8.1	3 27 35.4	11 0.1	3 26 14.3	22 9.9	9.618 7478	51631
9	201 31 14.4	3 22 41.0	10 7.6	3 3 58.7	22 20.5	9.623 7825	49055
10	204 51 37.5	3 18 8.7	9 7.8	2 41 35.0	22 26.2	9.628 5573	46435
11	208 7 38.9	3 13 57.6	− 8 2.1	+2 19 7.8	−22 27.5	9.633 0685	+43783
12	211 19 39.4	3 10 6.8	6 51.6	1 56 41.3	22 25.0	9.637 3133	41113
13	214 27 58.9	3 6 35.3	5 37.5	1 34 18.8	22 19.5	9.641 2907	38431
14	217 32 56.2	3 3 22.2	4 20.6	1 12 3.3	22 11.2	9.644 9992	35741
15	220 34 49.3	3 0 26.9	3 2.1	0 49 57.3	22 0.4	9.648 4390	33054
16	223 33 55.6	2 57 48.4	− 1 42.8	+0 28 3.2	−21 47.5	9.651 6101	+30370
17	226 30 31.5	2 55 26.1	− 0 23.4	+0 6 22.9	21 32.9	9.654 5132	27692
18	229 24 52.9	2 53 19.2	+ 0 55.2	−0 15 2.0	21 16.7	9.657 1489	25025
19	232 17 14.9	2 51 27.3	2 12.3	0 36 9.9	20 58.9	9.659 5185	22367
20	235 7 52.3	2 49 49.8	3 27.3	0 56 59.4	20 39.9	9.661 6225	19715
21	237 56 59.2	2 48 26.2	+ 4 39.6	−1 17 29.3	−20 19.7	9.663 4620	+17076
22	240 44 49.2	2 47 16.1	5 48.7	1 37 38.5	19 58.5	9.665 0383	14448
23	243 31 35.8	2 46 19.2	6 54.0	1 57 25.9	19 36.1	9.666 3519	11826
24	246 17 31.8	2 45 35.0	7 55.1	2 16 50.3	19 12.7	9.667 4038	9213
25	249 2 50.1	2 45 3.6	8 51.5	2 35 50.9	18 48.3	9.668 1947	6605
26	251 47 43.2	2 44 44.6	+ 9 42.9	−2 54 26.5	−18 22.7	9.668 7249	+ 4002
27	254 32 23.4	2 44 37.8	10 28.8	3 12 36.0	17 56.1	9.668 9952	+ 1403
28	257 17 3.0	2 44 43.4	11 8.9	3 30 18.4	17 28.5	9.669 0054	− 1198
29	260 1 54.3	2 45 1.1	11 42.8	3 47 32.5	16 59.5	9.668 7555	3800
30	262 47 9.3	2 45 31.0	12 10.3	4 4 17.0	16 29.3	9.668 2454	6402
May 1	265 33 0.4	2 46 13.3	+12 31.2	−4 20 30.6	−15 57.6	9.667 4750	− 9008
2	268 19 40.0	2 47 7.9	12 45.0	4 36 11.7	15 24.3	9.666 4435	11623
3	271 7 20.4	2 48 15.1	12 51.7	4 51 18.7	14 49.4	9.665 1502	14243
4	273 56 14.5	2 49 35.2	12 51.0	5 5 49.9	14 12.6	9.663 5947	16870
5	276 46 35.2	2 51 8.4	12 42.8	5 19 43.3	13 33.8	9.661 7757	19511
6	279 38 35.7	2 52 55.0	+12 26.9	−5 32 56.7	−12 52.6	9.659 6922	−22159
7	282 32 29.7	2 54 55.3	12 3.3	5 45 27.7	12 8.9	9.657 3436	24815
8	285 28 31.1	2 57 10.0	11 31.8	5 57 13.7	11 22.6	9.654 7287	27484
9	288 26 54.5	2 59 39.3	10 52.6	6 8 11.9	10 33.2	9.651 8465	30160
10	291 27 54.7	3 2 23.8	10 5.7	6 18 18.9	9 40.3	9.648 6965	32842
11	294 31 47.3	3 5 24.1	+ 9 11.2	−6 27 31.3	− 8 43.8	9.645 2778	−35533
12	297 38 48.3	3 8 40.8	8 9.4	6 35 45.2	7 43.2	9.641 5900	38220
13	300 49 14.6	3 12 14.6	7 0.5	6 42 56.3	6 38.2	9.637 6340	40902
14	304 3 23.4	3 16 6.1	5 45.1	6 49 0.0	5 28.3	9.633 4099	43576
15	307 21 32.9	3 20 16.0	4 23.6	6 53 51.1	4 13.0	9.628 9195	46228
16	310 44 1.8	3 24 45.0	+ 2 56.8	−6 57 24.1	− 2 52.0	9.624 1653	−48850
17	314 11 9.6	3 29 33.9	+ 1 25.5	−6 59 33.0	− 1 24.7	9.619 1508	−51431

FOR GREENWICH MEAN NOON.

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		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
May	17	314 11 9.6	3 29 33.9	+ 1 25.5	−6 59 33.0	− 1 24.7	9.619 1508	−51431
	18	317 43 16.5	3 34 43.4	− 0 9.3	7 0 11.2	+ 0 9.4	9.613 8811	53951
	19	321 20 43.4	3 40 14.0	1 46.3	6 59 11.8	1 50.7	9.608 3632	56393
	20	325 3 51.8	3 46 6.4	3 24.1	6 56 27.2	3 39.8	9.602 6058	58734
	21	328 53 3.6	3 52 21.0	5 0.9	6 51 49.6	5 36.8	9.596 6207	60945
	22	332 48 41.3	3 58 58.1	− 6 35.0	−6 45 10.8	+ 7 42.2	9.590 4221	−62997
	23	336 51 7.3	4 5 57.7	8 4.1	6 36 22.2	9 56.4	9.584 0280	64849
	24	341 0 44.1	4 13 19.6	9 25.9	6 25 15.1	12 19.2	9.577 4603	66460
	25	345 17 53.7	4 21 3.2	10 37.8	6 11 40.9	14 50.5	9.570 7458	67777
	26	349 42 57.4	4 29 7.6	11 37.0	5 55 31.4	17 29.8	9.563 9164	68749
	27	354 16 15.2	4 37 31.0	−12 20.8	−5 36 38.9	+20 16.2	9.557 0097	−69311
	28	358 58 4.9	4 46 11.0	12 46.5	5 14 57.0	23 8.5	9.550 0701	69395
	29	3 48 41.8	4 55 4.7	12 51.5	4 50 20.6	26 4.7	9.543 1490	68932
	30	8 48 17.6	5 4 8.1	12 33.6	4 22 47.1	29 2.3	9.536 3044	67851
	31	13 56 59.5	5 13 16.0	11 51.2	3 52 16.5	31 58.2	9.529 6020	66075
une	1	19 14 49.1	5 22 22.4	−10 43.5	−3 18 52.5	+34 48.4	9.523 1148	−63539
	2	24 41 41.4	5 31 20.0	9 11.0	2 42 43.1	37 28.2	9.516 9215	60185
	3	30 17 23.3	5 40 0.4	7 15.1	2 4 1.4	39 52.3	9.511 1064	55973
	4	36 1 33.3	5 48 14.3	4 59.1	1 23 5.7	41 55.1	9.505 7563	50879
	5	41 53 39.6	5 55 51.4	− 2 27.4	−0 40 20.4	43 30.5	9.500 9596	44914
	6	47 53 0.3	6 2 41.2	+ 0 13.7	+0 3 44.3	+44 33.0	9.496 8011	−38121
	7	53 58 42.7	6 8 33.1	2 57.1	0 48 33.1	44 57.8	9.493 3605	30575
	8	60 9 43.9	6 13 17.2	5 34.5	1 33 26.1	44 41.1	9.490 7073	22393
	9	66 24 51.3	6 16 44.0	7 57.7	2 17 40.7	43 40.6	9.488 8980	13727
	10	72 42 43.9	6 18 46.8	9 58.9	3 0 32.7	41 56.3	9.487 9721	− 4754
	11	79 1 55.3	6 19 20.7	+11 31.2	+3 41 19.3	+39 30.1	9.487 9507	+ 4324
	12	85 20 54.9	6 18 23.4	12 29.9	4 19 20.3	36 26.1	9.488 8337	13305
	13	91 38 12.1	6 15 56.1	12 52.1	4 54 0.7	32 49.9	9.490 6020	21991
	14	97 52 18.2	6 12 2.2	12 37.6	5 24 51.8	28 48.9	9.493 2163	30198
	15	104 1 49.9	6 6 48.6	11 48.2	5 51 32.7	24 30.7	9.496 6211	37777
	16	110 5 31.8	6 0 24.1	+10 27.9	+6 13 50.1	+20 3.3	9.500 7472	+44609
	17	116 2 17.9	5 52 58.9	8 42.1	6 31 38.8	15 34.5	9.505 5158	50615
	18	121 51 13.2	5 44 44.5	6 37.0	6 45 0.7	11 10.6	9.510 8415	55749
	19	127 31 34.4	5 35 52.6	4 19.4	6 54 3.6	6 57.3	9.516 6366	60006
	20	133 2 49.5	5 26 34.2	+ 1 55.8	6 59 0.4	+ 2 59.0	9.522 8139	63398
	21	138 24 37.5	5 17 0.0	− 0 27.7	+7 0 7.6	− 0 41.5	9.529 2891	+65972
	22	143 36 47.4	5 7 19.5	2 46.2	6 57 43.9	4 2.5	9.535 9829	67782
	23	148 39 17.1	4 57 40.8	4 55.2	6 52 9.5	7 3.0	9.542 8223	68895
	24	153 32 11.8	4 48 10.6	6 51.6	6 43 44.8	9 43.0	9.549 7412	69385
	25	158 15 42.9	4 38 54.4	8 33.0	6 32 50.1	12 3.3	9.556 6810	69325
	26	162 50 6.6	4 29 56.4	− 9 58.1	+6 19 44.5	−14 4.9	9.563 5902	+68784
	27	167 15 42.8	4 21 19.7	11 6.0	6 4 46.2	15 49.0	9.570 4241	67832
	28	171 32 53.9	4 13 6.6	11 56.8	5 48 11.9	17 17.1	9.577 1449	66529
	29	175 42 4.4	4 5 18.5	12 30.8	5 30 16.8	18 30.8	9.583 7201	64931
	30	179 43 39.5	3 57 56.0	12 48.8	5 11 14.5	19 31.8	9.590 1230	63089
July	1	183 38 5.1	3 50 59.5	−12 51.7	+4 51 17.1	−20 21.2	9.596 3312	+61047
	2	187 25 47.1	3 44 28.8	−12 40.8	+4 30 35.5	−21 0.6	9.602 3270	+58843

FOR GREENWICH MEAN NOON.

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		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
July	1	183 38 5.1	3 50 59.5	−12 51.7	+4 51 17.1	−20 21.2	9.596 3312	+61047
	2	187 25 47.1	3 44 28.8	12 40.8	4 30 35.5	21 0.6	9.602 3270	58843
	3	191 7 11.1	3 38 23.4	12 17.5	4 9 18.9	21 31.2	9.608 0954	56508
	4	194 42 42.1	3 32 42.7	11 42.9	3 47 35.7	21 54.0	9.613 6251	54069
	5	198 12 44.5	3 27 26.0	10 58.6	3 25 33.1	22 10.3	9.618 9066	51551
	6	201 37 41.8	3 22 32.3	−10 5.8	+3 3 17.1	−22 20.8	9.623 9333	+48975
	7	204 57 56.5	3 18 0.7	9 5.9	2 40 53.2	22 26.3	9.628 7000	46352
	8	208 13 50.3	3 13 50.2	8 0.0	2 18 26.0	22 27.5	9.633 2028	43701
	9	211 25 43.7	3 10 0.0	6 49.4	1 55 59.5	22 24.9	9.637 4395	41030
	10	214 33 56.8	3 6 29.2	5 35.1	1 33 37.2	22 19.3	9.641 4083	38346
	11	217 38 48.2	3 3 16.7	− 4 18.2	+1 11 21.9	−22 10.9	9.645 1085	+35658
	12	220 40 36.0	3 0 21.8	2 59.7	0 49 16.3	22 0.0	9.648 5399	32970
	13	223 39 37.4	2 57 43.8	1 40.3	0 27 22.6	21 47.1	9.651 7027	30287
	14	226 36 9.0	2 55 22.0	− 0 21.0	+0 5 42.7	21 32.4	9.654 5975	27611
	15	229 30 26.5	2 53 15.6	+ 0 57.6	−0 15 41.7	21 16.1	9.657 2251	24942
	16	232 22 45.2	2 51 24.1	+ 2 14.6	−0 36 49.0	−20 58.4	9.659 5862	+22283
	17	235 13 19.6	2 49 47.1	3 29.6	0 57 38.0	20 39.4	9.661 6821	19635
	18	238 2 24.0	2 48 23.9	4 41.8	1 18 7.3	20 19.1	9.663 5136	16996
	19	240 50 11.9	2 47 14.2	5 50.8	1 38 15.8	19 57.8	9.665 0817	14367
	20	243 36 56.8	2 46 17.7	6 56.0	1 58 2.5	19 35.4	9.666 3873	11747
	21	246 22 51.6	2 45 34.0	+ 7 57.0	−2 17 26.2	−19 11.9	9.667 4313	+ 9134
	22	249 8 9.0	2 45 2.9	8 53.2	2 36 26.0	18 47.5	9.668 2142	6525
	23	251 53 1.6	2 44 44.3	9 44.4	2 55 0.8	18 22.0	9.668 7365	3922
	24	254 37 41.7	2 44 38.0	10 30.1	3 13 9.6	17 55.3	9.668 9987	+ 1321
	25	257 22 21.6	2 44 43.8	11 10.0	3 30 51.1	17 27.5	9.669 0008	− 1278
	26	260 7 13.4	2 45 1.9	+11 43.8	−3 48 4.3	−16 58.6	9.668 7431	− 3878
	27	262 52 29.5	2 45 32.3	12 11.1	4 4 47.9	16 28.3	9.668 2251	6480
	28	265 38 22.0	2 46 14.8	12 31.7	4 21 0.4	15 56.5	9.667 4469	9088
	29	268 25 3.3	2 47 9.8	12 45.3	4 36 40.5	15 23.4	9.666 4073	11703
	30	271 12 45.9	2 48 17.5	12 51.8	4 51 46.5	14 48.3	9.665 1061	14322
	31	274 1 42.5	2 49 37.9	+12 50.9	−5 6 16.5	−14 11.4	9.663 5425	−16952
Aug.	1	276 52 6.1	2 51 11.5	12 42.4	5 20 8.7	13 32.5	9.661 7155	19589
	2	279 44 10.0	2 52 58.5	12 26.3	5 33 20.8	12 51.3	9.659 6243	22237
	3	282 38 7.7	2 54 59.3	12 2.4	5 45 50.4	12 7.6	9.657 2677	24896
	4	285 34 13.3	2 57 14.4	11 30.7	5 57 35.0	11 21.1	9.654 6448	27564
	5	288 32 41.3	2 59 44.1	+10 51.3	−6 8 31.6	−10 31.6	9.651 7546	−30240
	6	291 33 46.6	3 2 29.1	10 4.1	6 18 37.0	9 38.7	9.648 5965	32923
	7	294 37 44.7	3 5 29.8	9 9.4	6 27 47.7	8 42.0	9.645 1698	35611
	8	297 44 51.8	3 8 47.2	8 7.3	6 35 59.7	7 41.2	9.641 4743	38299
	9	300 55 24.7	3 12 21.4	6 58.3	6 43 8.7	6 36.1	9.637 5101	40982
	10	304 9 40.5	3 16 13.4	+ 5 42.7	−6 49 10.2	− 5 26.1	9.633 2782	−43655
	11	307 27 57.6	3 20 23.9	4 21.0	6 53 59.0	4 10.6	9.628 7798	46307
	12	310 50 34.7	3 24 53.5	2 54.0	6 57 29.4	2 49.3	9.624 0179	48925
	13	314 17 51.3	3 29 43.0	+ 1 22.6	6 59 35.6	− 1 21.9	9.618 9961	51503
	14	317 50 7.6	3 34 53.1	− 0 12.3	7 0 10.9	+ 0 12.5	9.613 7192	54023
	15	321 27 44.5	3 40 24.3	− 1 49.3	−6 59 8.3	+ 1 54.0	9.608 1942	−56462
	16	325 11 3.5	3 46 17.3	− 3 27.1	−6 56 20.4	+ 3 43.2	9.602 4302	−58799

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Aug.	16	325 11 3.5	3 46 17.3	− 3 27.1	−6 56 20.4	+ 3 43.2	9.602 4302	−58799
	17	329 0 26.6	3 52 32.6	5 3.9	6 51 39.2	5 40.6	9.596 4387	61006
	18	332 56 16.2	3 59 10.3	6 37.9	6 44 56.4	7 46.3	9.590 2344	63050
	19	336 58 54.7	4 6 10.5	8 6.8	6 36 3.7	10 0.7	9.583 8353	64896
	20	341 8 44.7	4 13 33.1	9 28.3	6 24 52.1	12 23.8	9.577 2633	66498
	21	345 26 8.1	4 21 17.3	−10 39.8	−6 11 13.3	+14 55.2	9.570 5455	−67807
	22	349 51 26.2	4 29 22.2	11 38.6	5 54 58.9	17 34.8	9.563 7136	68767
	23	354 24 58.9	4 37 46.1	12 21.9	5 36 1.3	20 21.4	9.556 8059	69314
	24	359 7 3.9	4 46 26.5	12 47.0	5 14 14.1	23 13.8	9.549 8667	69385
	25	3 57 56.5	4 55 20.6	12 51.3	4 49 32.4	26 10.1	9.542 9473	68905
	26	8 57 48.3	5 4 24.1	−12 32.7	−4 21 53.5	+29 7.7	9.536 1065	−67802
	27	14 6 46.2	5 13 31.9	11 49.5	3 51 17.6	32 3.5	9.529 4101	66004
	28	19 24 51.6	5 22 38.2	10 41.1	3 17 48.5	34 53.3	9.522 9310	63446
	29	24 51 59.5	5 31 35.3	9 7.8	2 41 34.4	37 32.7	9.516 7483	60067
	30	30 27 56.4	5 40 15.0	7 11.3	2 2 48.3	39 56.3	9.510 9463	55828
	31	36 12 20.5	5 48 27.8	− 4 54.7	−1 21 49.0	+41 58.2	9.505 6120	−50711
Sept.	1	42 4 39.7	5 56 3.7	− 2 22.6	−0 39 1.0	43 32.7	9.500 8332	44721
	2	48 4 12.0	6 2 52.0	+ 0 18.7	+0 5 5.5	44 34.3	9.496 6954	37903
	3	54 10 4.2	6 8 41.9	3 2.0	0 49 55.0	44 57.9	9.493 2776	30338
	4	60 21 13.1	6 13 23.7	5 39.1	1 34 47.4	44 39.8	9.490 6489	22141
	5	66 36 25.8	6 16 48.2	+ 8 1.7	+2 19 0.0	+43 38.0	9.488 8654	−13463
	6	72 54 21.4	6 18 46.5	10 2.1	3 1 48.8	41 52.4	9.487 9663	− 4485
	7	79 13 33.0	6 19 19.6	11 33.5	3 42 30.8	39 25.0	9.487 9717	+ 4592
	8	85 32 30.2	6 18 19.7	12 31.1	4 20 26.2	36 19.9	9.488 8813	13567
	9	91 49 42.3	6 15 49.6	12 52.2	4 55 0.0	32 42.9	9.490 6750	22241
	10	98 3 40.7	6 11 53.4	+12 36.6	+5 25 43.8	+28 41.2	9.493 3134	+30433
	11	104 13 2.5	6 6 37.7	11 46.3	5 52 16.8	24 22.7	9.496 7403	37988
	12	110 16 32.4	6 0 11.1	10 25.1	6 14 26.2	19 55.2	9.500 8861	44797
	13	116 13 4.7	5 52 44.4	8 38.6	6 32 6.8	15 26.4	9.505 6720	50777
	14	122 1 44.9	5 44 28.8	6 33.0	6 45 20.7	11 2.8	9.511 0123	55882
	15	127 41 49.9	5 35 35.9	+ 4 15.2	+6 54 16.0	+ 6 50.0	9.516 8192	+60111
	16	133 12 48.1	5 26 17.1	+ 1 51.5	6 59 5.7	+ 2 52.2	9.523 0059	63481
	17	138 34 18.8	5 16 42.8	− 0 32.0	7 0 6.3	− 0 47.8	9.529 4880	66030
	18	143 46 11.4	5 7 2.3	2 50.2	6 57 36.6	4 8.2	9.536 1866	67820
	19	148 48 23.8	4 57 23.6	4 58.9	6 51 56.8	7 8.1	9.543 0288	68915
	20	153 41 1.5	4 47 53.7	− 6 54.9	+6 43 27.3	− 9 47.6	9.549 9489	+69388
	21	158 24 16.0	4 38 38.1	8 35.8	6 32 28.3	12 7.3	9.556 8880	69310
	22	162 58 23.8	4 29 40.7	10 0.4	6 19 19.0	14 8.3	9.563 7951	68757
	23	167 23 44.6	4 21 4.8	11 7.8	6 4 17.6	15 51.8	9.570 6258	67795
	24	171 40 41.2	4 12 52.5	11 58.1	5 47 40.7	17 19.5	9.577 3424	66482
	25	175 49 37.8	4 5 5.1	−12 31.6	+5 29 43.3	−18 33.0	9.583 9124	+64876
	26	179 50 59.9	3 57 43.4	12 49.1	5 10 39.1	19 33.4	9.590 3095	63028
	27	183 45 13.3	3 50 47.6	12 51.6	4 50 40.3	20 22.5	9.596 5114	60980
	28	187 32 43.8	3 44 17.7	12 40.3	4 29 57.4	21 1.7	9.602 5002	58771
	29	191 13 57.1	3 38 13.2	12 16.6	4 8 39.9	21 32.0	9.608 2614	56434
	30	194 49 18.3	3 32 33.2	−11 41.7	+3 46 56.0	−21 54.7	9.613 7836	+53993
Oct.	1	198 19 11.4	3 27 17.1	−10 57.1	+3 24 52.8	−22 10.7	9.619 0574	+51473

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Oct.	1	198 19 11.4	3 27 17.1	−10 57.1	+3 24 52.8	−22 10.7	9.619 0574	+51473
	2	201 44 0.2	3 22 24.1	10 4.1	3 2 36.5	22 21.0	9.624 0763	48895
	3	205 4 7.0	3 17 53.1	9 3.9	2 40 12.4	22 26.4	9.628 8349	46273
	4	208 19 53.5	3 13 43.3	7 57.9	2 17 45.1	22 27.5	9.633 3299	43623
	5	211 31 40.3	3 9 53.6	6 47.2	1 55 18.7	22 24.8	9.637 5587	40949
	6	214 39 47.2	3 6 23.3	− 5 32.8	+1 32 56.5	−22 19.1	9.641 5194	+38264
	7	217 44 33.1	3 3 11.4	4 15.8	1 10 41.4	22 10.6	9.645 2115	35579
	8	220 46 15.8	3 0 17.0	2 57.2	0 48 36.1	21 59.7	9.648 6351	32892
	9	223 45 12.8	2 57 30.6	1 37.9	0 26 42.7	21 46.8	9.651 7899	30207
	10	226 41 40.3	2 55 18.2	− 0 18.5	+0 5 3.2	21 31.9	9.654 6767	27530
	11	229 35 54.3	2 53 12.4	+ 1 0.0	−0 16 20.6	−21 15.6	9.657 2962	+24862
	12	232 28 9.8	2 51 21.2	2 17.0	0 37 27.5	20 57.9	9.659 6495	22206
	13	235 18 41.5	2 49 44.5	3 31.8	0 58 15.9	20 38.7	9.661 7376	19558
	14	238 7 43.5	2 48 21.8	4 44.0	1 18 44.6	20 18.5	9.663 5613	16918
	15	240 55 29.6	2 47 12.5	5 52.9	1 38 52.5	19 57.1	9.665 1216	14290
	16	243 42 12.9	2 46 16.3	+ 6 57.9	−1 58 38.5	−19 34.7	9.666 4195	+11669
	17	246 28 6.5	2 45 33.1	7 58.8	2 18 1.6	19 11.2	9.667 4557	9055
	18	249 13 23.2	2 45 2.3	8 54.9	2 37 0.6	18 46.7	9.668 2308	6448
	19	251 58 15.3	2 44 44.0	9 45.9	2 55 34.7	18 21.2	9.668 7455	3846
	20	254 42 55.4	2 44 38.1	10 31.4	3 13 42.6	17 54.5	9.669 0000	+ 1246
	21	257 27 35.6	2 44 44.3	+11 11.2	−3 31 23.3	−17 26.7	9.668 9946	− 1355
	22	260 12 28.1	2 45 2.8	11 44.7	3 48 35.6	16 57.7	9.668 7290	3957
	23	262 57 45.2	2 45 33.5	12 11.8	4 5 18.3	16 27.3	9.668 2032	6559
	24	265 43 39.1	2 46 16.4	12 32.2	4 21 29.8	15 55.5	9.667 4170	9166
	25	268 30 22.1	2 47 11.8	12 45.7	4 37 8.9	15 22.3	9.666 3698	11780
	26	271 18 6.9	2 48 19.8	+12 51.9	−4 52 13.8	−14 47.2	9.665 0608	−14401
	27	274 7 6.0	2 49 40.6	12 50.7	5 6 42.7	14 10.2	9.663 4894	17029
	28	276 57 32.5	2 51 14.6	12 42.0	5 20 33.6	13 31.3	9.661 6546	19669
	29	279 49 39.7	2 53 2.0	12 25.7	5 33 44.5	12 50.0	9.659 5554	22316
	30	282 43 41.1	2 55 3.2	12 1.5	5 46 12.8	12 6.2	9.657 1910	24975
	31	285 39 50.9	2 57 18.7	+11 29.6	−5 57 56.0	−11 19.7	9.654 5601	−27644
Nov.	1	288 38 23.4	2 59 48.9	10 49.9	6 8 51.1	10 30.0	9.651 6619	30321
	2	291 39 33.8	3 2 34.4	10 2.5	6 18 54.8	9 36.9	9.648 4957	33003
	3	294 43 37.4	3 5 35.6	9 7.6	6 28 3.7	8 40.2	9.645 0611	35692
	4	297 50 50.5	3 8 53.3	8 5.3	6 36 13.8	7 39.3	9.641 3573	38381
	5	301 1 29.8	3 12 28.2	+ 6 56.1	−6 43 20.9	− 6 34.0	9.637 3851	−41063
	6	304 15 52.8	3 16 20.8	5 40.2	6 49 20.2	5 23.8	9.633 1451	43734
	7	307 34 17.5	3 20 31.8	4 18.4	6 54 6.7	4 8.2	9.628 6390	46385
	8	310 57 2.8	3 25 2.0	2 51.3	6 57 34.6	2 46.7	9.623 8691	49005
	9	314 24 28.2	3 29 52.1	+ 1 19.7	6 59 38.1	− 1 19.2	9.618 8395	51580
	10	317 56 53.9	3 35 2.8	− 0 15.2	−7 0 10.5	+ 0 15.4	9.613 5550	−54098
	11	321 34 40.9	3 40 34.7	1 52.3	6 59 4.8	1 57.2	9.608 0226	56534
	12	325 18 10.6	3 46 28.4	3 30.1	6 56 13.5	3 46.7	9.602 2516	58867
	13	329 7 45.1	3 52 44.3	5 6.8	6 51 28.7	5 44.3	9.596 2534	61072
	14	333 3 46.7	3 59 22.7	6 40.7	6 44 42.1	7 50.3	9.590 0427	63110
	15	337 6 38.0	4 6 23.7	− 8 9.4	−6 35 45.2	+10 4.9	9.583 6380	−64949
	16	341 16 41.5	4 13 47.0	− 9 30.6	−6 24 29.3	+12 28.3	9.577 0611	−66543

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Nov.	16	341 16 41.5	4 13 47.0	− 9 30.6	−6 24 29.3	+12 28.3	9.577 0611	−66543
	17	345 34 19.1	4 21 31.7	10 41.8	6 10 45.8	15 0.2	9.570 3392	67842
	18	349 59 51.9	4 29 37.2	11 40.2	5 54 26.5	17 39.8	9.563 5044	68791
	19	354 33 39.9	4 38 1.7	12 23.0	5 35 23.9	20 26.6	9.556 5949	69325
	20	359 16 0.8	4 46 42.6	12 47.5	5 13 31.4	23 19.2	9.549 6555	69378
	21	4 7 9.6	4 55 37.0	−12 51.1	−4 48 44.3	+26 15.6	9.542 7376	−68881
	22	9 7 17.9	5 4 40.8	12 31.7	4 20 59.9	29 13.1	9.535 9001	67759
	23	14 16 32.5	5 13 48.7	11 47.8	3 50 18.7	32 8.7	9.529 2091	65939
	24	19 34 54.6	5 22 54.7	10 38.6	3 16 44.4	34 58.5	9.522 7377	63357
	25	25 2 18.8	5 31 51.5	9 4.6	2 40 25.3	37 37.4	9.516 5651	59953
	26	30 38 31.6	5 40 30.5	− 7 7.4	−2 1 34.9	+40 0.3	9.510 7759	−55687
	27	36 23 10.7	5 48 42.4	4 50.2	1 20 31.9	42 1.6	9.505 4571	50542
	28	42 15 43.9	5 56 17.0	− 2 17.8	−0 37 41.0	43 35.2	9.500 6966	44526
	29	48 15 28.7	6 3 3.6	+ 0 23.7	+0 6 27.4	44 35.6	9.496 5795	37685
	30	54 21 31.6	6 8 51.7	3 6.9	0 51 17.5	44 58.0	9.493 1845	30099
Dec.	1	60 32 49.2	6 13 31.2	+ 5 43.7	+1 36 9.4	+44 38.6	9.490 5808	−21882
	2	66 48 8.2	6 16 53.2	8 5.8	2 20 20.1	43 35.4	9.488 8239	13193
	3	73 6 7.5	6 18 50.8	10 5.3	3 3 5.6	41 48.5	9.487 9520	− 4211
	4	79 25 20.1	6 19 19.3	11 35.8	3 43 43.2	39 19.9	9.487 9850	+ 4868
	5	85 44 15.6	6 18 16.5	12 32.3	4 21 32.9	36 13.7	9.488 9220	13837
	6	92 1 23.1	6 15 43.7	+12 52.3	+4 56 0.0	+32 35.8	9.490 7421	+22498
	7	98 15 14.4	6 11 45.0	12 35.6	5 26 36.4	28 33.5	9.493 4053	30671
	8	104 24 26.7	6 6 27.0	11 44.2	5 53 1.5	24 14.6	9.496 8551	38207
	9	110 27 44.9	5 59 58.5	10 22.2	6 15 2.7	19 47.0	9.501 0217	44992
	10	116 24 3.7	5 52 30.2	8 35.0	6 32 35.1	15 18.2	9.505 8258	50945
	11	122 12 28.9	5 44 13.2	+ 6 29.0	+6 45 41.0	+10 54.9	9.511 1817	+56027
	12	127 52 17.7	5 35 19.3	4 10.8	6 54 28.5	6 42.4	9.517 0018	60229
	13	133 22 58.9	5 25 59.8	+ 1 47.1	6 59 10.9	+ 2 45.1	9.523 1988	63571
	14	138 44 12.2	5 16 25.1	− 0 36.3	7 0 4.7	− 0 54.3	9.529 6888	66098
	15	143 55 47.1	5 6 44.5	2 54.3	6 57 28.9	4 14.0	9.536 3930	67864
	16	148 57 41.9	4 57 6.0	− 5 2.7	+6 51 43.5	− 7 13.3	9.543 2386	+68939
	17	153 50 2.2	4 47 36.6	6 58.2	6 43 9.2	9 52.1	9.550 1601	69392
	18	158 32 59.9	4 38 21.4	8 38.7	6 32 5.9	12 11.3	9.557 0989	69300
	19	163 6 51.2	4 29 24.7	10 2.7	6 18 52.9	14 11.7	9.564 0044	68735
	20	167 31 56.4	4 20 49.4	11 9.6	6 3 48.3	15 54.7	9.570 8322	67760
	21	171 48 37.9	4 12 37.7	−11 59.3	+5 47 8.7	−17 22.0	9.577 5448	+66438
	22	175 57 20.3	4 4 51.2	12 32.3	5 29 9.1	18 35.0	9.584 1101	64824
	23	179 58 28.9	3 57 30.3	12 49.4	5 10 3.0	19 35.2	9.590 5016	62969
	24	183 52 29.6	3 50 35.3	12 51.4	4 50 2.6	20 23.8	9.596 6973	60917
	25	187 39 48.2	3 44 6.2	12 39.8	4 29 18.6	21 2.7	9.602 6796	58704
	26	191 20 50.4	3 38 2.3	−12 15.7	+4 8 0.1	−21 32.8	9.608 4338	+56361
	27	194 56 1.1	3 32 23.1	11 40.5	3 46 15.5	21 55.2	9.613 9485	53917
	28	198 25 44.6	3 27 7.8	10 55.6	3 24 11.8	22 11.1	9.619 2147	51396
	29	201 50 24.3	3 22 15.4	10 2.3	3 1 55.2	22 21.3	9.624 2258	48816
	30	205 10 22.8	3 17 45.2	9 2.0	2 39 30.9	22 26.5	9.628 9765	46193
	31	208 26 1.7	3 13 36.0	− 7 55.8	+2 17 3.6	−22 27.4	9.633 4634	+43540
	32	211 37 41.5	......	− 6 44.9	+1 54 37.3	.....	9.637 6838	...

VENUS, 1919.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Jan. 1	19 24 12.78	+13.566	−23 6 19.3	+22.02	0.225 5322	−167.7	5.09	5.24	0 43.9
2	19 29 37.97	13.533	22 56 55.3	24.38	0.225 1245	172.1	5.09	5.24	0 45.4
3	19 35 2.34	13.498	22 46 49.3	26.12	0.224 7062	176.5	5.10	5.25	0 46.9
4	19 40 25.84	13.460	22 36 1.7	27.84	0.224 2774	180.9	5.10	5.25	0 48.3
5	19 45 48.42	13.421	22 24 32.9	29.55	0.223 8380	185.3	5.11	5.26	0 49.7
6	19 51 10.03	+13.380	−22 12 23.4	+31.24	0.223 3878	−189.8	5.11	5.26	0 51.1
7	19 56 30.63	13.337	21 59 33.8	32.89	0.222 9270	194.2	5.12	5.27	0 52.5
8	20 1 50.17	13.292	21 46 4.7	34.53	0.222 4556	198.6	5.12	5.27	0 53.9
9	20 7 8.62	13.246	21 31 56.5	36.15	0.221 9737	203.0	5.13	5.28	0 55.3
10	20 12 25.95	13.198	21 17 9.9	37.74	0.221 4812	207.4	5.13	5.28	0 56.7
11	20 17 42.12	+13.149	−21 1 45.4	+39.30	0.220 9782	−211.8	5.14	5.29	0 58.0
12	20 22 57.10	13.099	20 45 43.7	40.84	0.220 4648	216.1	5.15	5.30	0 59.3
13	20 28 10.88	13.049	20 29 5.5	42.35	0.219 9409	220.5	5.15	5.30	1 0.6
14	20 33 23.43	12.997	20 11 51.3	43.83	0.219 4066	224.8	5.16	5.31	1 1.9
15	20 38 34.73	12.945	19 54 1.8	45.29	0.218 8619	229.1	5.17	5.32	1 3.1
16	20 43 44.77	+12.892	−19 35 37.6	+46.72	0.218 3067	−233.5	5.17	5.32	1 4.3
17	20 48 53.53	12.838	19 16 39.4	48.12	0.217 7411	237.8	5.18	5.33	1 5.5
18	20 54 1.01	12.785	18 57 8.0	49.49	0.217 1650	242.3	5.19	5.34	1 6.7
19	20 59 7.20	12.731	18 37 4.1	50.83	0.216 5782	246.7	5.19	5.34	1 7.9
20	21 4 12.09	12.677	18 16 28.4	52.14	0.215 9807	251.2	5.20	5.35	1 9.0
21	21 9 15.69	+12.623	−17 55 21.6	+53.42	0.215 3725	−255.7	5.21	5.36	1 10.1
22	21 14 17.98	12.568	17 33 44.4	54.67	0.214 7533	260.3	5.22	5.37	1 11.2
23	21 19 18.98	12.515	17 11 37.7	55.88	0.214 1231	264.9	5.23	5.38	1 12.3
24	21 24 18.70	12.461	16 49 2.2	57.07	0.213 4818	269.5	5.23	5.38	1 13.4
25	21 29 17.13	12.408	16 25 58.6	58.22	0.212 8292	274.3	5.24	5.39	1 14.4
26	21 34 14.28	+12.355	−16 2 27.7	+59.34	0.212 1651	−279.1	5.25	5.40	1 15.4
27	21 39 10.17	12.303	15 38 30.3	60.43	0.211 4895	283.9	5.26	5.41	1 16.4
28	21 44 4.81	12.251	15 14 7.2	61.49	0.210 8021	288.9	5.27	5.42	1 17.3
29	21 48 58.21	12.199	14 49 19.1	62.51	0.210 1029	293.8	5.27	5.42	1 18.3
30	21 53 50.38	12.149	14 24 6.9	63.50	0.209 3917	298.8	5.28	5.43	1 19.2
31	21 58 41.35	+12.099	−13 58 31.3	+64.46	0.208 6684	−303.9	5.29	5.44	1 20.1
Feb. 1	22 3 31.13	12.050	13 32 33.2	65.38	0.207 9328	309.1	5.30	5.45	1 21.0
2	22 8 19.74	12.001	13 6 13.3	66.27	0.207 1849	314.2	5.30	5.46	1 21.9
3	22 13 7.20	11.954	12 39 32.5	67.12	0.206 4244	319.5	5.31	5.47	1 22.7
4	22 17 53.54	11.908	12 12 31.6	67.95	0.205 6513	324.8	5.32	5.48	1 23.5
5	22 22 38.77	+11.862	−11 45 11.3	+68.74	0.204 8655	−330.1	5.33	5.49	1 24.3
6	22 27 22.92	11.818	11 17 32.5	69.49	0.204 0670	335.4	5.34	5.50	1 25.1
7	22 32 6.03	11.775	10 49 35.9	70.22	0.203 2558	340.6	5.35	5.51	1 25.9
8	22 36 48.12	11.733	10 21 22.4	70.91	0.202 4319	346.0	5.36	5.52	1 26.7
9	22 41 29.22	11.692	9 52 52.7	71.56	0.201 5952	351.3	5.37	5.53	1 27.4
10	22 46 9.36	+11.653	− 9 24 7.6	+72.19	0.200 7456	−356.7	5.38	5.54	1 28.1
11	22 50 48.58	11.615	8 55 7.9	72.78	0.199 8831	362.1	5.39	5.55	1 28.8
12	22 55 26.91	11.579	8 25 54.3	73.34	0.199 0077	367.5	5.41	5.57	1 29.5
13	23 0 4.40	11.545	7 56 27.7	73.87	0.198 1193	372.9	5.42	5.58	1 30.2
14	23 4 41.07	11.512	7 26 48.7	74.37	0.197 2179	378.3	5.43	5.59	1 30.9
15	23 9 16.97	+11.480	− 6 56 58.1	+74.84	0.196 3034	−383.5	5.44	5.60	1 31.6
16	23 13 52.14	+11.451	− 6 26 56.7	+75.27	0.195 3756	−389.3	5.45	5.61	1 32.2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Feb. 16	23 13 52.14	+11.451	− 6 26 56.7	+75.27	0.195 3756	−389.3	5.45	5.61	1 32.2
17	23 18 26.61	11.423	5 56 45.2	75.68	0.194 4345	394.9	5.46	5.62	1 32.9
18	23 23 0.44	11.397	5 26 24.4	76.05	0.193 4800	400.5	5.48	5.64	1 33.5
19	23 27 33.66	11.372	4 55 55.0	76.40	0.192 5118	406.3	5.49	5.65	1 34.1
20	23 32 6.31	11.349	4 25 17.7	76.71	0.191 5298	412.1	5.50	5.66	1 34.7
21	23 36 38.43	+11.328	− 3 54 33.4	+76.98	0.190 5339	−417.9	5.52	5.68	1 35.3
22	23 41 10.07	11.309	3 23 42.7	77.23	0.189 5239	423.8	5.53	5.69	1 35.9
23	23 45 41.27	11.291	2 52 46.4	77.45	0.188 4996	429.8	5.54	5.70	1 36.5
24	23 50 12.07	11.276	2 21 45.2	77.64	0.187 4608	435.9	5.55	5.71	1 37.0
25	23 54 42.51	11.262	1 50 39.9	77.80	0.186 4072	442.1	5.57	5.73	1 37.6
26	23 59 12.64	+11.250	− 1 19 31.3	+77.92	0.185 3386	−448.4	5.58	5.74	1 38.1
27	0 3 42.50	11.239	0 48 20.0	78.02	0.184 2549	454.7	5.60	5.76	1 38.7
28	0 8 12.13	11.230	− 0 17 6.8	78.08	0.183 1558	461.2	5.61	5.77	1 39.2
Mar. 1	0 12 41.57	11.223	+ 0 14 7.5	78.11	0.182 0411	467.8	5.63	5.79	1 39.8
2	0 17 10.87	11.218	0 45 22.2	78.11	0.180 9105	474.4	5.64	5.80	1 40.3
3	0 21 40.05	+11.214	+ 1 16 36.5	+78.08	0.179 7638	−481.2	5.65	5.82	1 40.9
4	0 26 9.17	11.212	1 47 49.6	78.01	0.178 6009	487.9	5.66	5.83	1 41.4
5	0 30 38.26	11.212	2 19 0.9	77.92	0.177 4216	494.8	5.68	5.85	1 42.0
6	0 35 7.35	11.213	2 50 9.5	77.79	0.176 2258	501.7	5.70	5.87	1 42.5
7	0 39 36.49	11.216	3 21 14.8	77.64	0.175 0132	508.7	5.71	5.88	1 43.0
8	0 44 5.72	+11.220	+ 3 52 15.9	+77.45	0.173 7838	−515.7	5.73	5.90	1 43.6
9	0 48 35.08	11.226	4 23 12.2	77.23	0.172 5376	522.8	5.75	5.92	1 44.1
10	0 53 4.60	11.234	4 54 2.8	76.98	0.171 2744	529.9	5.76	5.93	1 44.7
11	0 57 34.32	11.243	5 24 47.2	76.71	0.169 9941	537.0	5.78	5.95	1 45.2
12	1 2 4.28	11.254	5 55 24.5	76.40	0.168 6967	544.2	5.80	5.97	1 45.8
13	1 6 34.53	+11.267	+ 6 25 54.0	+76.06	0.167 3820	−551.4	5.82	5.99	1 46.4
14	1 11 5.11	11.281	6 56 15.0	75.69	0.166 0499	558.7	5.83	6.00	1 46.9
15	1 15 36.05	11.297	7 26 26.8	75.29	0.164 7004	565.9	5.85	6.02	1 47.5
16	1 20 7.39	11.315	7 56 28.6	74.86	0.163 3333	573.3	5.87	6.04	1 48.1
17	1 24 39.17	11.334	8 26 19.8	74.40	0.161 9485	580.7	5.89	6.06	1 48.7
18	1 29 11.43	+11.355	+ 8 55 59.6	+73.91	0.160 5458	−588.2	5.91	6.08	1 49.3
19	1 33 44.20	11.377	9 25 27.3	73.39	0.159 1250	595.8	5.93	6.10	1 49.9
20	1 38 17.53	11.401	9 54 42.1	72.84	0.157 6859	603.4	5.95	6.12	1 50.5
21	1 42 51.45	11.426	10 23 43.3	72.26	0.156 2284	611.2	5.97	6.14	1 51.1
22	1 47 26.00	11.453	10 52 30.2	71.65	0.154 7522	619.0	5.99	6.16	1 51.7
23	1 52 1.20	+11.481	+11 21 2.1	+71.01	0.153 2571	−626.9	6.00	6.18	1 52.4
24	1 56 37.09	11.510	11 49 18.2	70.33	0.151 7429	634.9	6.03	6.21	1 53.0
25	2 1 13.71	11.541	12 17 17.8	69.63	0.150 2094	643.0	6.05	6.23	1 53.7
26	2 5 51.07	11.573	12 45 0.2	68.90	0.148 6562	651.3	6.07	6.25	1 54.4
27	2 10 29.21	11.606	13 12 24.6	68.13	0.147 0832	659.6	6.09	6.27	1 55.1
28	2 15 8.16	+11.640	+13 39 30.2	+67.33	0.145 4899	−668.1	6.11	6.29	1 55.8
29	2 19 47.94	11.675	14 6 16.4	66.51	0.143 8762	676.7	6.14	6.32	1 56.5
30	2 24 28.57	11.711	14 32 42.4	65.65	0.142 2417	685.4	6.16	6.34	1 57.2
31	2 29 10.07	11.748	14 58 47.5	64.77	0.140 5861	694.2	6.19	6.37	1 58.0
Apr. 1	2 33 52.47	11.785	15 24 30.9	63.84	0.138 9092	703.2	6.21	6.39	1 58.8
2	2 38 35.77	+11.823	+15 49 51.8	+62.89	0.137 2106	−712.3	6.24	6.42	1 59.5
3	2 43 19.98	+11.861	+16 14 49.5	+61.91	0.135 4901	−721.5	6.26	6.44	2 [illegible]

VENUS, 1919.

GREENWICH MEAN TIME.

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	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
Apr. 1	2 33 52.47	+11.785	+15 24 30.9	+63.84	0.138 9092	− 703.2	6.21	6.39	1 58.8
2	2 38 35.77	11.823	15 49 51.8	62.89	0.137 2106	712.3	6.24	6.42	1 59.5
3	2 43 19.98	11.861	16 14 49.5	61.91	0.135 4901	721.5	6.26	6.44	2 0.3
4	2 48 5.12	11.900	16 39 23.3	60.90	0.133 7474	730.7	6.29	6.47	2 1.1
5	2 52 51.20	11.940	17 3 32.5	59.86	0.131 9825	740.1	6.31	6.49	2 2.0
6	2 57 38.22	+11.979	+17 27 16.3	+58.79	0.130 1950	− 749.5	6.33	6.52	2 2.8
7	3 2 26.19	12.019	17 50 34.0	57.69	0.128 3849	759.0	6.36	6.55	2 3.7
8	3 7 15.11	12.058	18 13 25.0	56.56	0.126 5520	768.4	6.38	6.57	2 4.6
9	3 12 4.98	12.098	18 35 48.5	55.40	0.124 6963	778.0	6.41	6.60	2 5.5
10	3 16 55.81	12.138	18 57 43.8	54.21	0.122 8175	787.7	6.44	6.63	2 6.4
11	3 21 47.59	+12.177	+19 19 10.3	+53.00	0.120 9155	− 797.3	6.47	6.66	2 7.3
12	3 26 40.32	12.217	19 40 7.3	51.75	0.118 9903	807.0	6.50	6.69	2 8.2
13	3 31 34.00	12.256	20 0 34.1	50.48	0.117 0416	816.9	6.53	6.72	2 9.1
14	3 36 28.62	12.295	20 20 30.0	49.18	0.115 0692	826.8	6.56	6.75	2 10.1
15	3 41 24.17	12.334	20 39 54.4	47.85	0.113 0729	836.8	6.59	6.78	2 11.1
16	3 46 20.64	+12.372	+20 58 46.7	+46.50	0.111 0526	− 846.8	6.63	6.82	2 12.1
17	3 51 18.01	12.409	21 17 6.3	45.12	0.109 0081	856.9	6.66	6.85	2 13.1
18	3 56 16.27	12.446	21 34 52.5	43.72	0.106 9392	867.2	6.68	6.88	2 14.1
19	4 1 15.41	12.482	21 52 4.8	42.30	0.104 8456	877.5	6.71	6.91	2 15.2
20	4 6 15.39	12.517	22 8 42.6	40.85	0.102 7272	887.9	6.75	6.95	2 16.3
21	4 11 16.20	+12.551	+22 24 45.3	+39.37	0.100 5836	− 898.4	6.78	6.98	2 17.3
22	4 16 17.81	12.583	22 40 12.4	37.88	0.098 4147	909.0	6.82	7.02	2 18.4
23	4 21 20.19	12.615	22 55 3.3	36.36	0.096 2201	919.8	6.85	7.05	2 19.5
24	4 26 23.30	12.645	23 9 17.5	34.82	0.093 9995	930.7	6.89	7.09	2 20.6
25	4 31 27.12	12.673	23 22 54.6	33.26	0.091 7525	941.8	6.92	7.12	2 21.8
26	4 36 31.60	+12.700	+23 35 54.0	+31.69	0.089 4788	− 953.0	6.96	7.16	2 22.9
27	4 41 36.70	12.725	23 48 15.4	30.09	0.087 1781	964.3	7.00	7.20	2 24.1
28	4 46 42.38	12.748	23 59 58.3	28.48	0.084 8499	975.8	7.03	7.24	2 25.2
29	4 51 48.59	12.769	24 11 2.2	26.85	0.082 4939	987.5	7.07	7.28	2 26.3
30	4 56 55.28	12.788	24 21 26.9	25.20	0.080 1096	999.4	7.11	7.32	2 27.5
May 1	5 2 2.39	+12.804	+24 31 11.9	+23.54	0.077 6968	−1011.4	7.15	7.36	2 28.7
2	5 7 9.86	12.818	24 40 16.9	21.87	0.075 2550	1023.5	7.19	7.40	2 29.9
3	5 12 17.64	12.830	24 48 41.7	20.19	0.072 7840	1035.7	7.23	7.44	2 31.1
4	5 17 25.66	12.838	24 56 26.0	18.50	0.070 2836	1048.0	7.27	7.48	2 32.3
5	5 22 33.85	12.844	25 3 29.5	16.79	0.067 7535	1060.4	7.32	7.53	2 33.5
6	5 27 42.15	+12.847	+25 9 52.0	+15.08	0.065 1934	−1073.0	7.36	7.57	2 34.7
7	5 32 50.50	12.848	25 15 33.4	13.37	0.062 6032	1085.6	7.40	7.62	2 35.9
8	5 37 58.83	12.846	25 20 33.5	11.64	0.059 9826	1098.3	7.45	7.67	2 37.1
9	5 43 7.07	12.841	25 24 52.2	9.91	0.057 3314	1111.1	7.49	7.71	2 38.3
10	5 48 15.16	12.833	25 28 29.4	8.19	0.054 6494	1123.9	7.54	7.76	2 39.5
11	5 53 23.03	+12.822	+25 31 25.1	+ 6.45	0.051 9364	−1136.9	7.59	7.81	2 40.6
12	5 58 30.61	12.809	25 33 39.2	4.72	0.049 1923	1149.9	7.64	7.86	2 41.8
13	6 3 37.82	12.792	25 35 11.8	2.99	0.046 4167	1163.1	7.69	7.91	2 43.0
14	6 8 44.59	12.772	25 36 2.9	+ 1.26	0.043 6095	1176.3	7.73	7.96	2 44.2
15	6 13 50.87	12.750	25 36 12.5	− 0.46	0.040 7704	1189.6	7.78	8.01	2 45.3
16	6 18 56.58	+12.725	+25 35 40.8	− 2.18	0.037 8992	−1203.1	7.83	8.06	2 46.5
17	6 24 1.66	+12.697	+25 34 28.0	− 3.89	0.034 9956	−1216.7	7.89	8.12	2 47.6

GREENWICH MEAN TIME.

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	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
May 17	6 24 1.66	+12.697	+25 34 28.0	− 3.89	0.034 9956	−1216.7	7.89	8.12	2 47.6
18	6 29 6.04	12.667	25 32 34.1	5.60	0.032 0592	1230.3	7.94	8.17	2 48.8
19	6 34 9.67	12.634	25 29 59.4	7.29	0.029 0899	1244.1	8.00	8.23	2 49.9
20	6 39 12.47	12.599	25 26 44.0	8.98	0.026 0873	1258.1	8.05	8.29	2 51.0
21	6 44 14.38	12.560	25 22 48.3	10.66	0.023 0510	1272.2	8.11	8.35	2 52.1
22	6 49 15.33	+12.519	+25 18 12.5	−12.32	0.019 9808	−1286.4	8.16	8.40	2 53.1
23	6 54 15.27	12.475	25 12 56.9	13.98	0.016 8762	1300.8	8.22	8.46	2 54.2
24	6 59 14.13	12.429	25 7 1.8	15.61	0.013 7368	1315.4	8.29	8.53	2 55.2
25	7 4 11.85	12.380	25 0 27.7	17.23	0.010 5620	1330.2	8.35	8.59	2 56.2
26	7 9 8.37	12.329	24 53 14.8	18.84	0.007 3515	1345.2	8.40	8.65	2 57.2
27	7 14 3.63	+12.276	+24 45 23.7	−20.42	0.004 1047	−1360.5	8.47	8.72	2 58.2
28	7 18 57.58	12.219	24 36 54.8	21.98	0.000 8210	1375.9	8.53	8.78	2 59.2
29	7 23 50.14	12.161	24 27 48.6	23.53	9.997 5000	1391.6	8.60	8.85	3 0.1
30	7 28 41.27	12.100	24 18 5.5	25.06	9.994 1410	1407.5	8.67	8.92	3 1.0
31	7 33 30.91	12.036	24 7 46.1	26.56	9.990 7437	1423.6	8.73	8.99	3 1.9
June 1	7 38 18.99	+11.970	+23 56 51.0	−28.03	9.987 3075	−1439.9	8.80	9.06	3 2.8
2	7 43 5.46	11.902	23 45 20.7	29.49	9.983 8322	1456.3	8.87	9.13	3 3.6
3	7 47 50.27	11.832	23 33 15.9	30.91	9.980 3172	1472.9	8.95	9.21	3 4.4
4	7 52 33.37	11.759	23 20 37.1	32.31	9.976 7621	1489.7	9.02	9.28	3 5.2
5	7 57 14.71	11.685	23 7 25.0	33.69	9.973 1667	1506.5	9.09	9.36	3 5.9
6	8 1 54.25	+11.609	+22 53 40.2	−35.04	9.969 5306	−1523.6	9.17	9.44	3 6.6
7	8 6 31.94	11.531	22 39 23.4	36.36	9.965 8534	1540.8	9.25	9.52	3 7.3
8	8 11 7.74	11.452	22 24 35.2	37.65	9.962 1348	1558.1	9.33	9.60	3 7.9
9	8 15 41.61	11.370	22 9 16.4	38.91	9.958 3745	1575.5	9.41	9.69	3 8.6
10	8 20 13.51	11.288	21 53 27.5	40.15	9.954 5721	1593.1	9.49	9.77	3 9.2
11	8 24 43.41	+11.204	+21 37 9.3	−41.36	9.950 7273	−1610.9	9.58	9.86	3 9.7
12	8 29 11.28	11.118	21 20 22.5	42.54	9.946 8398	1628.8	9.67	9.95	3 10.2
13	8 33 37.08	11.032	21 3 7.8	43.68	9.942 9091	1646.8	9.75	10.04	3 10.7
14	8 38 0.80	10.944	20 45 25.9	44.80	9.938 9350	1665.0	9.84	10.13	3 11.1
15	8 42 22.40	10.856	20 27 17.5	45.89	9.934 9169	1683.4	9.93	10.22	3 11.6
16	8 46 41.86	+10.766	+20 8 43.4	−46.95	9.930 8545	−1702.0	10.03	10.32	3 11.9
17	8 50 59.16	10.676	19 49 44.3	47.97	9.926 7474	1720.7	10.12	10.42	3 12.3
18	8 55 14.28	10.584	19 30 20.9	48.97	9.922 5952	1739.5	10.22	10.52	3 12.6
19	8 59 27.19	10.492	19 10 34.0	49.94	9.918 3974	1758.7	10.32	10.62	3 12.9
20	9 3 37.88	10.399	18 50 24.2	50.87	9.914 1534	1778.0	10.42	10.72	3 13.1
21	9 7 46.33	+10.305	+18 29 52.4	−51.78	9.909 8626	−1797.6	10.52	10.83	3 13.3
22	9 11 52.53	10.211	18 8 59.2	52.65	9.905 5245	1817.5	10.63	10.94	3 13.4
23	9 15 56.46	10.116	17 47 45.5	53.49	9.901 1384	1837.6	10.74	11.05	3 13.5
24	9 19 58.09	10.020	17 26 12.0	54.29	9.896 7036	1858.1	10.84	11.16	3 13.6
25	9 23 57.41	9.923	17 4 19.6	55.07	9.892 2194	1878.8	10.96	11.28	3 13.6
26	9 27 54.40	+ 9.826	+16 42 8.9	−55.81	9.887 6850	−1899.9	11.08	11.40	3 13.6
27	9 31 49.03	9.727	16 19 40.8	56.52	9.883 0997	1921.2	11.19	11.52	3 13.6
28	9 35 41.29	9.628	15 56 56.1	57.20	9.878 4628	1942.9	11.31	11.64	3 13.5
29	9 39 31.14	9.526	15 33 55.6	57.84	9.873 7736	1964.8	11.44	11.77	3 13.4
30	9 43 18.55	9.424	15 10 40.2	58.44	9.869 0314	1987.1	11.56	11.90	3 13.2
July 1	9 47 3.50	+ 9.321	+14 47 10.6	−59.01	9.864 2355	−2009.5	11.69	12.03	3 13.0
2	9 50 45.96	+ 9.217	+14 23 27.8	−59.55	9.859 3855	−2032.2	11.81	12.16	3 [illegible]

VENUS, 1919.

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
		h m s	s	° ′ ″	″			″	″	h m
July	1	9 47 3.50	+9.321	+14 47 10.6	−59.01	9.864 2355	−2009.5	11.69	12.03	3 13.0
	2	9 50 45.96	9.217	14 23 27.8	59.55	9.859 3855	2032.2	11.81	12.16	3 12.8
	3	9 54 25.90	9.111	13 59 32.5	60.05	9.854 4807	2055.1	11.95	12.30	3 12.5
	4	9 58 3.28	9.004	13 35 25.6	60.52	9.849 5207	2078.2	12.09	12.44	3 12.2
	5	10 1 38.08	8.896	13 11 7.9	60.95	9.844 5051	2101.5	12.23	12.59	3 11.8
	6	10 5 10.26	+8.786	+12 46 40.2	−61.35	9.839 4333	−2125.0	12.38	12.74	3 11.4
	7	10 8 39.78	8.675	12 22 3.4	61.71	9.834 3050	2148.6	12.52	12.89	3 11.0
	8	10 12 6.61	8.561	11 57 18.3	62.04	9.829 1197	2172.4	12.67	13.04	3 10.5
	9	10 15 30.71	8.447	11 32 25.7	62.34	9.823 8772	2196.4	12.83	13.20	3 9.9
	10	10 18 52.04	8.331	11 7 26.4	62.60	9.818 5770	2220.5	12.98	13.36	3 9.3
	11	10 22 10.57	+8.213	+10 42 21.3	−62.82	9.813 2188	−2244.7	13.15	13.53	3 8.7
	12	10 25 26.25	8.093	10 17 11.3	63.02	9.807 8025	2269.0	13.31	13.70	3 8.0
	13	10 28 39.03	7.972	9 51 57.1	63.16	9.802 3277	2293.4	13.48	13.87	3 7.3
	14	10 31 48.88	7.849	9 26 39.7	63.28	9.796 7943	2317.8	13.65	14.05	3 6.5
	15	10 34 55.74	7.723	9 1 19.7	63.37	9.791 2020	2342.4	13.83	14.23	3 5.7
	16	10 37 59.56	+7.595	+ 8 35 58.2	−63.42	9.785 5506	−2367.1	14.01	14.42	3 4.8
	17	10 41 0.28	7.465	8 10 35.9	63.43	9.779 8400	2391.8	14.20	14.61	3 3.8
	18	10 43 57.86	7.333	7 45 13.8	63.41	9.774 0700	2416.6	14.39	14.81	3 2.8
	19	10 46 52.23	7.198	7 19 52.7	63.35	9.768 2404	2441.5	14.58	15.01	3 1.8
	20	10 49 43.32	7.060	6 54 33.4	63.25	9.762 3510	2466.4	14.78	15.21	3 0.7
	21	10 52 31.08	+6.919	+ 6 29 17.0	−63.11	9.756 4018	−2491.3	14.98	15.42	2 59.6
	22	10 55 15.42	6.775	6 4 4.3	62.94	9.750 3925	2516.4	15.19	15.63	2 58.4
	23	10 57 56.27	6.628	5 38 56.4	62.72	9.744 3230	2541.5	15.40	15.85	2 57.1
	24	11 0 33.53	6.477	5 13 54.2	62.46	9.738 1932	2566.6	15.62	16.08	2 55.8
	25	11 3 7.12	6.322	4 48 58.8	62.15	9.732 0033	2591.7	15.85	16.31	2 54.4
	26	11 5 36.93	+6.162	+ 4 24 11.2	−61.80	9.725 7533	−2616.7	16.08	16.55	2 52.9
	27	11 8 2.86	5.998	3 59 32.6	61.41	9.719 4435	2641.5	16.31	16.79	2 51.4
	28	11 10 24.77	5.828	3 35 4.1	60.96	9.713 0744	2666.1	16.56	17.04	2 49.8
	29	11 12 42.55	5.653	3 10 47.0	60.46	9.706 6467	2690.3	16.80	17.29	2 48.1
	30	11 14 56.07	5.472	2 46 42.5	59.91	9.700 1613	2714.1	17.05	17.55	2 46.4
	31	11 17 5.18	+5.286	+ 2 22 51.9	−59.30	9.693 6194	−2737.3	17.31	17.82	2 44.6
Aug.	1	11 19 9.75	5.094	1 59 16.4	58.64	9.687 0226	2759.9	17.58	18.09	2 42.7
	2	11 21 9.62	4.894	1 35 57.5	57.92	9.680 3725	2781.7	17.85	18.37	2 40.8
	3	11 23 4.63	4.688	1 12 56.5	57.15	9.673 6712	2802.6	18.13	18.66	2 38.8
	4	11 24 54.61	4.476	0 50 14.9	56.31	9.666 9210	2822.4	18.41	18.95	2 36.7
	5	11 26 39.40	+4.256	+ 0 27 54.2	−55.40	9.660 1247	−2841.0	18.70	19.25	2 34.5
	6	11 28 18.83	4.029	+ 0 5 56.0	54.43	9.653 2855	2858.2	18.99	19.55	2 32.2
	7	11 29 52.72	3.794	− 0 15 38.1	53.40	9.646 4068	2873.8	19.30	19.86	2 29.8
	8	11 31 20.87	3.551	0 36 46.4	52.29	9.639 4926	2887.7	19.61	20.18	2 27.3
	9	11 32 43.11	3.301	0 57 27.2	51.10	9.632 5475	2899.6	19.93	20.51	2 24.7
	10	11 33 59.25	+3.043	− 1 17 38.6	−49.84	9.625 5764	−2909.3	20.25	20.84	2 22.0
	11	11 35 9.09	2.776	1 37 18.8	48.50	9.618 5847	2916.7	20.58	21.18	2 19.2
	12	11 36 12.44	2.502	1 56 25.8	47.08	9.611 5786	2921.3	20.91	21.52	2 16.3
	13	11 37 9.12	2.220	2 14 57.5	45.56	9.604 5648	2923.0	21.25	21.87	2 13.4
	14	11 37 58.94	1.930	2 32 52.0	43.97	9.597 5506	2921.6	21.60	22.23	2 10.3
	15	11 38 41.71	+1.633	− 2 50 7.1	−42.28	9.590 5437	−2916.9	21.95	22.59	2 7.0
	16	11 39 17.25	+1.328	− 3 6 40.6	−40.50	9.583 5526	−2908.4	22.31	22.96	2 3.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Aug. 16	11 39 17.25	+1.328	−3 6 40.6	−40.50	9.583 5526	−2908.4	22.31	22.96	2 3.7
17	11 39 45.40	1.017	3 22 30.1	38.62	9.576 5866	2895.9	22.67	23.33	2 0.2
18	11 40 6.00	0.698	3 37 33.4	36.64	9.569 6555	2879.2	23.03	23.70	1 56.6
19	11 40 18.87	0.373	3 51 47.8	34.55	9.562 7701	2857.9	23.40	24.08	1 52.9
20	11 40 23.87	+0.042	4 5 10.9	32.35	9.555 9417	2831.6	23.77	24.46	1 49.0
21	11 40 20.87	−0.293	−4 17 40.0	−30.06	9.549 1829	−2799.9	24.14	24.85	1 45.0
22	11 40 9.77	0.633	4 29 12.8	27.65	9.542 5067	2762.6	24.51	25.23	1 40.9
23	11 39 50.44	0.978	4 39 46.3	25.12	9.535 9274	2719.2	24.89	25.62	1 36.6
24	11 39 22.82	1.324	4 49 17.8	22.48	9.529 4598	2669.4	25.26	26.00	1 32.2
25	11 38 46.88	1.671	4 57 44.7	19.74	9.523 1198	2612.8	25.64	26.39	1 27.7
26	11 38 2.61	−2.018	−5 5 4.6	−16.90	9.516 9244	−2548.7	26.00	26.76	1 23.0
27	11 37 10.02	2.363	5 11 14.8	13.94	9.510 8925	2476.7	26.37	27.14	1 18.2
28	11 36 9.20	2.704	5 16 12.8	10.88	9.505 0428	2396.7	26.73	27.51	1 13.3
29	11 35 0.28	3.039	5 19 56.5	7.74	9.499 3949	2308.5	27.08	27.87	1 8.2
30	11 33 43.41	3.365	5 22 23.7	4.52	9.493 9688	2211.7	27.42	28.22	1 3.0
31	11 32 18.84	−3.681	−5 23 32.9	− 1.23	9.488 7857	−2106.1	27.75	28.56	0 57.6
Sept. 1	11 30 46.84	3.982	5 23 22.6	+ 2.10	9.483 8665	1991.7	28.06	28.88	0 52.2
2	11 29 7.86	4.266	5 21 52.0	5.46	9.479 2326	1868.4	28.36	29.19	0 46.6
3	11 27 22.24	4.532	5 19 0.3	8.85	9.474 9051	1736.4	28.64	29.48	0 40.9
4	11 25 30.52	4.775	5 14 47.4	12.22	9.470 9045	1596.0	28.91	29.76	0 35.1
5	11 23 33.24	−4.994	−5 9 13.8	+15.57	9.467 2508	−1447.4	29.16	30.01	0 29.3
6	11 21 31.05	5.184	5 2 20.6	18.85	9.463 9632	1291.0	29.38	30.24	0 23.3
7	11 19 24.62	5.346	4 54 9.3	22.06	9.461 0596	1127.6	29.58	30.44	0 17.3
8	11 17 14.69	5.475	4 44 42.5	25.15	9.458 5559	957.9	29.74	30.61	0 11.2
9	11 15 2.08	5.570	4 34 3.2	28.10	9.456 4662	782.7	29.89	30.76	0 5.1 23 58.9
10	11 12 47.61	−5.630	−4 22 15.0	+30.89	9.454 8025	− 603.0	30.00	30.88	23 52.7
11	11 10 32.15	5.652	4 9 21.9	33.50	9.453 5745	419.9	30.09	30.97	23 46.6
12	11 8 16.59	5.638	3 55 28.8	35.89	9.452 7887	234.7	30.14	31.02	23 40.4
13	11 6 1.82	5.586	3 40 41.0	38.05	9.452 4489	− 48.5	30.17	31.05	23 34.3
14	11 3 48.74	5.498	3 25 4.3	39.96	9.452 5558	+ 137.5	30.16	31.04	23 28.2
15	11 1 38.21	−5.374	−3 8 44.8	+41.61	9.453 1076	+ 322.0	30.12	31.00	23 22.2
16	10 59 31.07	5.215	2 51 49.0	42.99	9.454 0994	503.9	30.05	30.93	23 16.2
17	10 57 28.13	5.025	2 34 23.5	44.09	9.455 5236	682.2	29.95	30.83	23 10.3
18	10 55 30.13	4.803	2 16 34.8	44.92	9.457 3702	855.8	29.83	30.70	23 4.5
19	10 53 37.79	4.554	1 58 29.3	45.49	9.459 6209	1023.8	29.67	30.54	22 58.8
20	10 51 51.72	−4.280	−1 40 13.7	+45.77	9.462 2794	+1185.5	29.49	30.35	22 53.2
21	10 50 12.51	3.984	1 21 54.5	45.79	9.465 3120	1340.4	29.28	30.14	22 47.7
22	10 48 40.67	3.666	1 3 37.6	45.57	9.468 7074	1487.8	29.06	29.91	22 42.4
23	10 47 16.66	3.332	0 45 29.0	45.11	9.472 4472	1627.3	28.81	29.65	22 37.2
24	10 46 0.83	2.984	0 27 34.0	44.43	9.476 5118	1758.5	28.54	29.37	22 32.2
25	10 44 53.51	−2.624	−0 9 58.0	+43.54	9.480 8812	+1881.2	28.25	29.08	22 27.3
26	10 43 54.95	2.255	+0 7 14.4	42.46	9.485 5350	1995.6	27.95	28.77	22 22.5
27	10 43 5.35	1.878	0 23 58.6	41.20	9.490 4531	2101.4	27.64	28.45	22 17.9
28	10 42 24.85	1.496	0 40 10.6	39.78	9.495 6151	2198.8	27.31	28.11	22 13.4
29	10 41 53.54	1.112	0 55 46.8	38.22	9.501 0008	2287.9	26.97	27.76	22 9.1
30	10 41 31.46	−0.728	+1 10 44.0	+36.53	9.506 5904	+2368.8	26.63	27.41	22 4.9
Oct. 1	10 41 18.60	−0.344	+1 24 59.5	+34.74	9.512 3646	+2441.8	26.28	27.05	22 [illegible]

VENUS, 1919.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Oct. 1	10 41 18.60	−0.344	+1 24 59.5	+34.74	9.512 3646	+2441.8	26.28	27.05	22 0.9
2	10 41 14.92	+0.037	1 38 30.8	32.85	9.518 3048	2507.1	25.92	26.68	21 57.1
3	10 41 20.35	0.415	1 51 15.7	30.88	9.524 3930	2565.2	25.56	26.31	21 53.4
4	10 41 34.78	0.787	2 3 12.4	28.84	9.530 6121	2616.3	25.19	25.93	21 49.8
5	10 41 58.07	1.153	2 14 19.6	26.74	9.536 9462	2661.0	24.83	25.56	21 46.4
6	10 42 30.06	+1.512	+2 24 36.0	+24.61	9.543 3799	+2699.4	24.46	25.18	21 43.1
7	10 43 10.57	1.863	2 34 0.8	22.44	9.549 8987	2731.9	24.11	24.81	21 40.0
8	10 43 59.43	2.207	2 42 33.1	20.25	9.556 4888	2758.9	23.74	24.43	21 37.0
9	10 44 56.43	2.541	2 50 12.5	18.04	9.563 1373	2780.7	23.38	24.06	21 34.1
10	10 46 1.33	2.866	2 56 58.8	15.82	9.569 8322	2797.6	23.02	23.69	21 31.4
11	10 47 13.93	+3.182	+3 2 51.9	+13.60	9.576 5622	+2810.1	22.67	23.33	21 28.8
12	10 48 33.98	3.488	3 7 51.8	11.39	9.583 3171	2818.3	22.32	22.97	21 26.3
13	10 50 1.26	3.783	3 11 58.8	9.19	9.590 0870	2822.6	21.97	22.61	21 23.9
14	10 51 35.50	4.068	3 15 13.3	7.02	9.596 8629	2823.4	21.63	22.26	21 21.6
15	10 53 16.45	4.343	3 17 35.9	4.87	9.603 6366	2820.9	21.30	21.92	21 19.5
16	10 55 3.87	+4.607	+3 19 7.1	+ 2.74	9.610 4010	+2815.6	20.97	21.58	21 17.4
17	10 56 57.50	4.861	3 19 47.7	+ 0.65	9.617 1495	2807.7	20.65	21.25	21 15.5
18	10 58 57.10	5.104	3 19 38.5	− 1.41	9.623 8763	2797.6	20.33	20.92	21 13.6
19	11 1 2.42	5.338	3 18 40.2	3.44	9.630 5761	2785.3	20.01	20.60	21 11.8
20	11 3 13.23	5.562	3 16 53.8	5.42	9.637 2442	2771.3	19.71	20.29	21 10.1
21	11 5 29.30	+5.776	+3 14 20.2	− 7.37	9.643 8771	+2755.7	19.41	19.98	21 8.5
22	11 7 50.40	5.981	3 11 0.2	9.28	9.650 4704	2738.6	19.12	19.68	21 7.0
23	11 10 16.33	6.178	3 6 54.9	11.15	9.657 0216	2720.4	18.83	19.38	21 5.6
24	11 12 46.87	6.366	3 2 5.2	12.98	9.663 5279	2701.3	18.56	19.10	21 4.2
25	11 15 21.82	6.546	2 56 32.1	14.77	9.669 9871	2681.2	18.28	18.81	21 2.9
26	11 18 1.00	+6.718	+2 50 16.6	−16.52	9.676 3971	+2660.3	18.01	18.54	21 1.7
27	11 20 44.23	6.883	2 43 19.6	18.22	9.682 7562	2638.8	17.75	18.27	21 0.5
28	11 23 31.35	7.042	2 35 42.2	19.89	9.689 0628	2616.7	17.50	18.01	20 59.4
29	11 26 22.18	7.193	2 27 25.3	21.52	9.695 3160	2594.2	17.25	17.75	20 58.4
30	11 29 16.57	7.338	2 18 29.8	23.10	9.701 5146	2571.3	17.00	17.50	20 57.4
31	11 32 14.38	+7.478	+2 8 56.8	−24.64	9.707 6579	+2548.1	16.76	17.25	20 56.5
Nov. 1	11 35 15.46	7.611	1 58 47.3	26.14	9.713 7451	2524.6	16.53	17.01	20 55.6
2	11 38 19.68	7.740	1 48 2.2	27.61	9.719 7757	2500.9	16.30	16.78	20 54.8
3	11 41 26.92	7.863	1 36 42.5	29.03	9.725 7494	2477.1	16.08	16.55	20 54.0
4	11 44 37.07	7.982	1 24 49.0	30.42	9.731 6658	2453.2	15.86	16.32	20 53.3
5	11 47 50.01	+8.096	+1 12 22.8	−31.76	9.737 5246	+2429.2	15.65	16.11	20 52.6
6	11 51 5.65	8.207	0 59 24.7	33.07	9.743 3258	2405.1	15.44	15.89	20 51.9
7	11 54 23.89	8.313	0 45 55.9	34.33	9.749 0690	2380.9	15.23	15.68	20 51.3
8	11 57 44.64	8.415	0 31 57.2	35.55	9.754 7541	2356.7	15.04	15.48	20 50.8
9	12 1 7.80	8.515	0 17 29.8	36.73	9.760 3809	2332.3	14.85	15.28	20 50.3
10	12 4 33.31	+8.610	+0 2 34.4	−37.88	9.765 9492	+2308.0	14.65	15.08	20 49.8
11	12 8 1.07	8.703	−0 12 48.0	38.98	9.771 4591	2283.6	14.47	14.89	20 49.3
12	12 11 31.02	8.792	0 28 36.2	40.03	9.776 9105	2259.3	14.29	14.71	20 48.9
13	12 15 3.06	8.878	0 44 49.2	41.05	9.782 3036	2234.9	14.12	14.53	20 48.5
14	12 18 37.14	8.961	1 1 26.1	42.02	9.787 6383	2210.7	13.94	14.35	20 48.2
15	12 22 13.18	+9.042	−1 18 25.9	−42.95	9.792 9151	+2186.6	13.78	14.18	20 47.9
	12 25 51.12	+9.120	−1 35 47.6	−43.85	9.798 1343	+2162.7	13.61	14.01	20 47.6

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Nov. 16	12 25 51.12	+ 9.120	− 1 35 47.6	−43.85	9.798 1343	+2162.7	13.61	14.01	20 47.6
17	12 29 30.90	9.195	1 53 30.2	44.69	9.803 2963	2139.0	13.45	13.84	20 47.3
18	12 33 12.45	9.268	2 11 32.5	45.50	9.808 4016	2115.5	13.29	13.68	20 47.1
19	12 36 55.74	9.339	2 29 53.7	46.27	9.813 4507	2092.2	13.14	13.52	20 46.9
20	12 40 40.71	9.408	2 48 32.9	46.99	9.818 4443	2069.2	12.99	13.37	20 46.7
21	12 44 27.31	+ 9.475	− 3 7 29.0	−47.68	9.823 3829	+2046.4	12.84	13.22	20 46.6
22	12 48 15.51	9.541	3 26 41.0	48.32	9.828 2671	2023.9	12.70	13.07	20 46.5
23	12 52 5.27	9.605	3 46 8.0	48.93	9.833 0978	2001.7	12.55	12.92	20 46.4
24	12 55 56.56	9.669	4 5 49.1	49.49	9.837 8757	1979.9	12.42	12.78	20 46.3
25	12 59 49.35	9.730	4 25 43.3	50.02	9.842 6015	1958.3	12.28	12.64	20 46.3
26	13 3 43.61	+ 9.791	− 4 45 49.6	−50.50	9.847 2760	+1937.1	12.15	12.51	20 46.3
27	13 7 39.33	9.851	5 6 7.2	50.95	9.851 8999	1916.2	12.03	12.38	20 46.3
28	13 11 36.47	9.910	5 26 35.1	51.37	9.856 4738	1895.5	11.90	12.25	20 46.3
29	13 15 35.03	9.969	5 47 12.5	51.74	9.860 9986	1875.2	11.77	12.12	20 46.3
30	13 19 34.99	10.027	6 7 58.3	52.07	9.865 4748	1855.1	11.66	12.00	20 46.4
Dec. 1	13 23 36.34	+10.085	− 6 28 51.8	−52.37	9.869 9032	+1835.3	11.53	11.87	20 46.5
2	13 27 39.07	10.143	6 49 51.9	52.63	9.874 2846	1815.8	11.42	11.75	20 46.6
3	13 31 43.18	10.200	7 10 57.9	52.86	9.878 6195	1796.7	11.31	11.64	20 46.8
4	13 35 48.66	10.257	7 32 8.8	53.04	9.882 9088	1777.8	11.19	11.52	20 47.0
5	13 39 55.52	10.315	7 53 23.7	53.19	9.887 1529	1759.0	11.09	11.41	20 47.2
6	13 44 3.76	+10.372	− 8 14 41.7	−53.30	9.891 3522	+1740.4	10.98	11.30	20 47.4
7	13 48 13.37	10.429	8 36 2.0	53.38	9.895 5072	1722.1	10.87	11.19	20 47.6
8	13 52 24.36	10.487	8 57 23.6	53.41	9.899 6186	1704.0	10.78	11.09	20 47.9
9	13 56 36.74	10.544	9 18 45.6	53.41	9.903 6866	1686.0	10.67	10.98	20 48.2
10	14 0 50.49	10.602	9 40 7.2	53.38	9.907 7115	1668.1	10.57	10.88	20 48.5
11	14 5 5.62	+10.659	−10 1 27.3	−53.30	9.911 6937	+1650.4	10.47	10.78	20 48.8
12	14 9 22.14	10.717	10 22 45.1	53.18	9.915 6335	1632.8	10.39	10.69	20 49.1
13	14 13 40.04	10.774	10 43 59.6	53.03	9.919 5314	1615.5	10.29	10.59	20 49.5
14	14 17 59.31	10.832	11 5 10.0	52.83	9.923 3878	1598.2	10.20	10.50	20 49.9
15	14 22 19.96	10.889	11 26 15.2	52.60	9.927 2031	1581.2	10.11	10.41	20 50.3
16	14 26 41.98	+10.946	−11 47 14.4	−52.33	9.930 9777	+1564.4	10.03	10.32	20 50.8
17	14 31 5.37	11.003	12 8 6.6	52.02	9.934 7123	1547.8	9.94	10.23	20 51.3
18	14 35 30.13	11.060	12 28 51.0	51.67	9.938 4072	1531.4	9.85	10.14	20 51.8
19	14 39 56.25	11.117	12 49 26.6	51.29	9.942 0631	1515.2	9.77	10.06	20 52.3
20	14 44 23.75	11.174	13 9 52.6	50.87	9.945 6805	1499.3	9.69	9.97	20 52.8
21	14 48 52.61	+11.231	−13 30 8.1	−50.41	9.949 2598	+1483.5	9.61	9.89	20 53.3
22	14 53 22.84	11.288	13 50 12.1	49.92	9.952 8017	1468.1	9.53	9.81	20 53.9
23	14 57 54.43	11.345	14 10 3.8	49.39	9.956 3066	1452.7	9.45	9.73	20 54.5
24	15 2 27.38	11.402	14 29 42.4	48.82	9.959 7750	1437.7	9.38	9.65	20 55.1
25	15 7 1.70	11.458	14 49 6.9	48.22	9.963 2077	1422.9	9.31	9.58	20 55.8
26	15 11 37.37	+11.515	−15 8 16.5	−47.58	9.966 6050	+1408.3	9.23	9.50	20 56.5
27	15 16 14.40	11.571	15 27 10.3	46.90	9.969 9677	1394.0	9.16	9.43	20 57.2
28	15 20 52.78	11.628	15 45 47.5	46.19	9.973 2962	1379.9	9.09	9.36	20 57.9
29	15 25 32.52	11.684	16 4 7.3	45.45	9.976 5912	1366.0	9.03	9.29	20 58.6
30	15 30 13.61	11.740	16 22 8.8	44.67	9.979 8531	1352.3	8.96	9.22	20 59.4
31	15 34 56.04	+11.796	−16 39 51.2	−43.86	9.983 0824	+1338.8	8.89	9.15	21 0.2
32	15 39 39.82	+11.852	−16 57 13.7	−43.01	9.986 2797	+1325.6	8.82	9.08	21 1.0

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Jan.	1	301 52 43.8	1 34 50.9	+3 0.9	−2 26 22.8	−3 54.3	9.862 2580	+118
	3	305 2 26.2	1 34 51.6	2 59.2	2 33 57.8	3 40.6	9.862 2772	73
	5	308 12 10.2	1 34 52.4	2 55.2	2 41 4.7	3 26.2	9.862 2873	+ 28
	7	311 21 55.9	1 34 53.4	2 49.1	2 47 42.2	3 11.2	9.862 2884	− 17
	9	314 31 43.9	1 34 54.6	2 41.0	2 53 49.1	2 55.6	9.862 2804	63
	11	317 41 34.4	1 34 56.0	+2 30.9	−2 59 24.3	−2 39.5	9.862 2634	−108
	13	320 51 28.0	1 34 57.6	2 19.0	3 4 26.8	2 22.9	9.862 2374	153
	15	324 1 24.9	1 34 59.3	2 5.3	3 8 55.5	2 5.8	9.862 2024	197
	17	327 11 25.3	1 35 1.1	1 50.2	3 12 49.8	1 48.4	9.862 1586	241
	19	330 21 29.6	1 35 3.2	1 33.7	3 16 8.9	1 30.6	9.862 1062	284
	21	333 31 38.1	1 35 5.3	+1 16.0	−3 18 52.1	−1 12.6	9.862 0451	−326
	23	336 41 50.9	1 35 7.5	0 57.4	3 20 59.0	0 54.3	9.861 9758	367
	25	339 52 8.2	1 35 9.8	0 38.1	3 22 29.0	0 35.7	9.861 8983	407
	27	343 2 30.3	1 35 12.3	+0 18.3	3 23 21.9	−0 17.1	9.861 8129	446
	29	346 12 57.3	1 35 14.8	−0 1.7	3 23 37.4	+0 1.6	9.861 7198	484
	31	349 23 29.4	1 35 17.3	−0 21.7	−3 23 15.6	+0 20.2	9.861 6194	−520
Feb.	2	352 34 6.7	1 35 20.0	0 41.4	3 22 16.4	0 38.9	9.861 5118	555
	4	355 44 49.3	1 35 22.7	1 0.7	3 20 39.9	0 57.5	9.861 3974	588
	6	358 55 37.4	1 35 25.4	1 19.2	3 18 26.4	1 16.0	9.861 2767	619
	8	2 6 31.0	1 35 28.2	1 36.7	3 15 36.1	1 34.2	9.861 1498	649
	10	5 17 30.3	1 35 31.1	−1 53.1	−3 12 9.6	+1 52.2	9.861 0173	−676
	12	8 28 35.4	1 35 34.0	2 8.0	3 8 7.5	2 9.9	9.860 8794	702
	14	11 39 46.2	1 35 36.9	2 21.4	3 3 30.4	2 27.2	9.860 7367	725
	16	14 51 3.0	1 35 39.9	2 33.1	2 58 19.1	2 44.1	9.860 5896	746
	18	18 2 25.8	1 35 42.9	2 42.9	2 52 34.5	3 0.4	9.860 4384	765
	20	21 13 54.6	1 35 45.9	−2 50.7	−2 46 17.7	+3 16.3	9.860 2837	−781
	22	24 25 29.6	1 35 49.0	2 56.3	2 39 29.6	3 31.6	9.860 1260	796
	24	27 37 10.8	1 35 52.2	2 59.8	2 32 11.6	3 46.3	9.859 9656	808
	26	30 48 58.4	1 35 55.4	3 1.0	2 24 24.8	4 0.3	9.859 8031	817
	28	34 0 52.3	1 35 58.6	3 0.0	2 16 10.8	4 13.6	9.859 6391	823
Mar.	2	37 12 52.7	1 36 1.8	−2 56.8	−2 7 30.9	+4 26.2	9.859 4740	−827
	4	40 24 59.7	1 36 5.2	2 51.3	1 58 26.7	4 37.9	9.859 3083	829
	6	43 37 13.4	1 36 8.6	2 43.7	1 48 59.9	4 48.8	9.859 1426	828
	8	46 49 33.9	1 36 11.9	2 34.0	1 39 12.2	4 58.8	9.858 9773	824
	10	50 2 1.1	1 36 15.3	2 22.4	1 29 5.5	5 7.8	9.858 8131	818
	12	53 14 35.2	1 36 18.8	−2 9.0	−1 18 41.6	+5 16.0	9.858 6503	−809
	14	56 27 16.4	1 36 22.3	1 54.0	1 8 2.3	5 23.1	9.858 4896	797
	16	59 40 4.6	1 36 25.9	1 37.5	0 57 9.8	5 29.3	9.858 3315	783
	18	62 53 0.0	1 36 29.5	1 19.8	0 46 6.0	5 34.4	9.858 1764	767
	20	66 6 2.6	1 36 33.1	1 1.1	0 34 53.1	5 38.4	9.858 0248	748
	22	69 19 12.3	1 36 36.7	−0 41.6	−0 23 33.0	+5 41.4	9.857 8773	−727
	24	72 32 29.3	1 36 40.3	0 21.5	0 12 8.1	5 43.3	9.857 7342	703
	26	75 45 53.5	1 36 43.9	−0 1.2	−0 0 40.4	5 44.2	9.857 5961	677
	28	78 59 24.9	1 36 47.5	+0 19.2	+0 10 47.9	5 43.9	9.857 4635	649
	30	82 13 3.5	1 36 51.1	0 39.3	0 22 14.5	5 42.5	9.857 3367	619
Apr.	1	85 26 49.3	1 36 54.6	+0 59.0	+0 33 37.3	+5 40.1	9.857 2161	−587
	3	88 40 42.0	1 36 58.1	+1 17.8	+0 44 54.0	+5 36.5	9.857 1022	−552

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
pr.	1	85 26 49.3	1 36 54.6	+0 59.0	+0 33 37.3	+5 40.1	9.857 2161	−587
	3	88 40 42.0	1 36 58.1	1 17.8	0 44 54.0	5 36.5	9.857 1022	552
	5	91 54 41.7	1 37 1.5	1 35.8	0 56 2.5	5 31.8	9.856 9954	516
	7	95 8 48.1	1 37 4.9	1 52.5	1 7 0.6	5 26.1	9.856 8959	479
	9	98 23 1.1	1 37 8.1	2 7.8	1 17 46.2	5 19.3	9.856 8041	439
	11	101 37 20.5	1 37 11.2	+2 21.4	+1 28 17.1	+5 11.5	9.856 7204	−398
	13	104 51 45.9	1 37 14.2	2 33.3	1 38 31.4	5 2.6	9.856 6449	356
	15	108 6 17.2	1 37 17.0	2 43.2	1 48 26.9	4 52.8	9.856 5779	313
	17	111 20 53.8	1 37 19.6	2 51.0	1 58 1.8	4 42.0	9.856 5197	269
	19	114 35 35.6	1 37 22.1	2 56.6	2 7 14.1	4 30.2	9.856 4705	223
	21	117 50 22.0	1 37 24.3	+3 0.0	+2 16 2.1	+4 17.6	9.856 4304	−178
	23	121 5 12.7	1 37 26.3	3 1.0	2 24 24.0	4 4.2	9.856 3995	131
	25	124 20 7.0	1 37 28.0	2 59.7	2 32 18.2	3 49.9	9.856 3779	84
	27	127 35 4.6	1 37 29.5	2 56.2	2 39 43.1	3 34.9	9.856 3658	− 37
	29	130 50 4.9	1 37 30.7	2 50.3	2 46 37.2	3 19.1	9.856 3631	+ 10
ay	1	134 5 7.2	1 37 31.6	+2 42.3	+2 52 59.1	+3 2.8	9.856 3699	+ 58
	3	137 20 11.0	1 37 32.2	2 32.2	2 58 47.8	2 45.8	9.856 3862	105
	5	140 35 15.7	1 37 32.4	2 20.1	3 4 1.9	2 28.2	9.856 4118	151
	7	143 50 20.4	1 37 32.3	2 6.2	3 8 40.5	2 10.3	9.856 4467	198
	9	147 5 24.7	1 37 31.9	1 50.7	3 12 42.7	1 51.8	9.856 4908	243
	11	150 20 27.8	1 37 31.1	+1 33.8	+3 16 7.6	+1 33.1	9.856 5439	+288
	13	153 35 29.0	1 37 30.0	1 15.7	3 18 54.8	1 14.0	9.856 6059	332
	15	156 50 27.5	1 37 28.5	0 56.6	3 21 3.6	0 54.8	9.856 6765	374
	17	160 5 22.8	1 37 26.7	0 36.8	3 22 33.7	0 35.3	9.856 7556	416
	19	163 20 14.0	1 37 24.5	+0 16.5	3 23 24.8	+0 15.8	9.856 8428	456
	21	166 35 0.6	1 37 22.0	−0 4.0	+3 23 36.8	−0 3.8	9.856 9378	+495
	23	169 49 41.8	1 37 19.1	0 24.4	3 23 9.7	0 23.3	9.857 0405	532
	25	173 4 16.9	1 37 16.0	0 44.5	3 22 3.7	0 42.7	9.857 1503	567
	27	176 18 45.4	1 37 12.5	1 4.0	3 20 19.0	1 2.0	9.857 2670	600
	29	179 33 6.6	1 37 8.7	1 22.7	3 17 56.0	1 21.0	9.857 3901	631
	31	182 47 20.0	1 37 4.7	−1 40.3	+3 14 55.2	−1 39.7	9.857 5193	+661
une	2	186 1 25.1	1 37 0.4	1 56.6	3 11 17.4	1 58.1	9.857 6542	688
	4	189 15 21.3	1 36 55.8	2 11.5	3 7 3.2	2 16.0	9.857 7943	713
	6	192 29 8.1	1 36 51.0	2 24.6	3 2 13.6	2 33.5	9.857 9391	735
	8	195 42 45.3	1 36 46.1	2 35.9	2 56 49.6	2 50.4	9.858 0882	755
	10	198 56 12.4	1 36 41.0	−2 45.3	+2 50 52.3	−3 6.8	9.858 2411	+773
	12	202 9 29.2	1 36 35.7	2 52.5	2 44 22.9	3 22.5	9.858 3974	789
	14	205 22 35.3	1 36 30.4	2 57.6	2 37 22.6	3 37.6	9.858 5564	801
	16	208 35 30.7	1 36 25.0	3 0.4	2 29 53.0	3 51.9	9.858 7178	812
	18	211 48 15.2	1 36 19.5	3 1.0	2 21 55.5	4 5.5	9.858 8810	820
	20	215 0 48.7	1 36 14.0	−2 59.2	+2 13 31.6	−4 18.2	9.859 0455	+825
	22	218 13 11.2	1 36 8.5	2 55.3	2 4 43.1	4 30.2	9.859 2108	827
	24	221 25 22.7	1 36 3.0	2 49.1	1 55 31.5	4 41.2	9.859 3763	827
	26	224 37 23.3	1 35 57.6	2 40.9	1 45 58.8	4 51.4	9.859 5415	825
	28	227 49 13.1	1 35 52.3	2 30.6	1 36 6.7	5 0.6	9.859 7060	820
	30	231 0 52.4	1 35 47.1	−2 18.5	+1 25 57.2	−5 8.8	9.859 8692	+812
uly	2	234 12 21.4	1 35 42.0	−2 4.7	+1 15 32.1	−5 16.1	9.860 0306	+802

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
July	2	234 12 21.4	1 35 42.0	−2 4.7	+1 15 32.1	−5 16.1	9.860 0306	+802
	4	237 23 40.4	1 35 37.0	1 49.3	1 4 53.4	5 22.4	9.860 1897	789
	6	240 34 49.7	1 35 32.3	1 32.6	0 54 3.2	5 27.7	9.860 3460	774
	8	243 45 49.7	1 35 27.7	1 14.8	0 43 3.4	5 32.0	9.860 4991	756
	10	246 56 40.8	1 35 23.4	0 56.0	0 31 56.1	5 35.2	9.860 6484	737
	12	250 7 23.4	1 35 19.3	−0 36.6	+0 20 43.3	−5 37.4	9.860 7936	+715
	14	253 17 58.0	1 35 15.4	−0 16.8	+0 9 27.2	5 38.5	9.860 9342	691
	16	256 28 25.2	1 35 11.8	+0 3.3	−0 1 50.2	5 38.7	9.861 0697	664
	18	259 38 45.5	1 35 8.5	0 23.3	0 13 6.9	5 37.8	9.861 1998	636
	20	262 48 59.3	1 35 5.4	0 43.0	0 24 20.8	5 35.9	9.861 3240	606
	22	265 59 7.4	1 35 2.7	+1 2.1	−0 35 29.8	−5 33.0	9.861 4420	+574
	24	269 9 10.1	1 35 0.2	1 20.5	0 46 32.0	5 29.0	9.861 5535	541
	26	272 19 8.2	1 34 58.0	1 37.9	0 57 25.3	5 24.1	9.861 6581	505
	28	275 29 2.1	1 34 56.1	1 54.1	1 8 7.8	5 18.2	9.861 7555	468
	30	278 38 52.6	1 34 54.5	2 8.9	1 18 37.5	5 11.4	9.861 8454	430
Aug.	1	281 48 40.1	1 34 53.1	+2 22.2	−1 28 52.7	−5 3.6	9.861 9275	+391
	3	284 58 25.2	1 34 52.1	2 33.7	1 38 51.4	4 54.9	9.862 0016	350
	5	288 8 8.6	1 34 51.3	2 43.3	1 48 31.8	4 45.4	9.862 0676	309
	7	291 17 50.7	1 34 50.8	2 50.9	1 57 52.3	4 35.0	9.862 1251	266
	9	294 27 32.1	1 34 50.6	2 56.4	2 6 51.1	4 23.7	9.862 1741	223
	11	297 37 13.3	1 34 50.6	+2 59.8	−2 15 26.7	−4 11.7	9.862 2143	+179
	13	300 46 54.8	1 34 50.9	3 1.0	2 23 37.5	3 58.9	9.862 2457	135
	15	303 56 37.2	1 34 51.4	3 0.0	2 31 22.0	3 45.4	9.862 2682	90
	17	307 6 20.7	1 34 52.2	2 56.8	2 38 38.8	3 31.3	9.862 2816	+ 45
	19	310 16 6.0	1 34 53.2	2 51.5	2 45 26.7	3 16.5	9.862 2861	0
	21	313 25 53.4	1 34 54.3	+2 44.1	−2 51 44.5	−3 1.1	9.862 2815	− 46
	23	316 35 43.2	1 34 55.6	2 34.6	2 57 30.8	2 45.2	9.862 2679	91
	25	319 45 35.9	1 34 57.1	2 23.3	3 2 44.8	2 28.7	9.862 2453	135
	27	322 55 31.7	1 34 58.8	2 10.3	3 7 25.4	2 11.8	9.862 2139	179
	29	326 5 31.1	1 35 0.6	1 55.6	3 11 31.8	1 54.5	9.862 1736	223
	31	329 15 34.2	1 35 2.5	+1 39.6	−3 15 3.2	−1 36.8	9.862 1246	−267
Sept.	2	332 25 41.3	1 35 4.6	1 22.3	3 17 59.0	1 18.9	9.862 0670	309
	4	335 35 52.6	1 35 6.8	1 4.0	3 20 18.6	1 0.7	9.862 0011	350
	6	338 46 8.4	1 35 9.1	0 44.9	3 22 1.5	0 42.2	9.861 9270	390
	8	341 56 28.9	1 35 11.4	0 25.3	3 23 7.3	0 23.6	9.861 8450	430
	10	345 6 54.2	1 35 13.9	+0 5.3	−3 23 35.9	−0 5.0	9.861 7552	−468
	12	348 17 24.5	1 35 16.4	−0 14.7	3 23 27.2	+0 13.7	9.861 6580	504
	14	351 27 59.9	1 35 19.0	0 34.6	3 22 41.0	0 32.5	9.861 5537	539
	16	354 38 40.5	1 35 21.7	0 54.0	3 21 17.4	0 51.1	9.861 4424	573
	18	357 49 26.6	1 35 24.4	1 12.8	3 19 16.7	1 9.6	9.861 3247	604
	20	1 0 18.1	1 35 27.1	−1 30.7	−3 16 39.2	+1 27.9	9.861 2008	−634
	22	4 11 15.1	1 35 29.9	1 47.5	3 13 25.3	1 45.9	9.861 0711	663
	24	7 22 17.9	1 35 32.8	2 3.0	3 9 35.6	2 3.7	9.860 9359	689
	26	10 33 26.4	1 35 35.7	2 17.0	3 5 10.6	2 21.2	9.860 7958	712
	28	13 44 40.7	1 35 38.6	2 29.2	3 0 11.1	2 38.2	9.860 6511	734
	30	16 56 0.9	1 35 41.6	−2 39.7	−2 54 38.0	+2 54.8	9.860 5022	−754
Oct.	2	20 7 27.1	1 35 44.5	−2 48.2	−2 48 32.3	+3 10.9	9.860 3497	−771

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
Oct. 2	20 7 27.1	1 35 44.6	−2 48.2	−2 48 32.3	+3 10.9	9.860 3497	−771
4	23 18 59.3	1 35 47.6	2 54.6	2 41 54.9	3 26.4	9.860 1939	786
6	26 30 37.7	1 35 50.8	2 58.8	2 34 47.2	3 41.3	9.860 0353	799
8	29 42 22.4	1 35 53.9	3 0.8	2 27 10.3	3 55.5	9.859 8745	809
10	32 54 13.3	1 35 57.1	3 0.6	2 19 5.6	4 9.0	9.859 7119	817
12	36 6 10.7	1 36 0.3	−2 58.1	−2 10 34.6	+4 21.9	9.859 5480	−822
14	39 18 14.5	1 36 3.6	2 53.4	2 1 38.7	4 33.9	9.859 3833	824
16	42 30 25.0	1 36 6.9	2 46.6	1 52 19.7	4 45.0	9.859 2184	824
18	45 42 42.1	1 36 10.2	2 37.6	1 42 39.1	4 55.4	9.859 0537	822
20	48 55 5.9	1 36 13.6	2 26.7	1 32 38.9	5 4.7	9.858 8898	817
22	52 7 36.7	1 36 17.1	−2 13.9	−1 22 20.8	+5 13.2	9.858 7272	−809
24	55 20 14.3	1 36 20.5	1 59.4	1 11 46.8	5 20.7	9.858 5663	799
26	58 32 58.9	1 36 24.1	1 43.4	1 0 58.7	5 27.2	9.858 4077	786
28	61 45 50.6	1 36 27.6	1 26.1	0 49 58.7	5 32.6	9.858 2520	771
30	64 58 49.4	1 36 31.2	1 7.7	0 38 48.8	5 37.1	9.858 0995	753
Nov. 1	68 11 55.4	1 36 34.8	−0 48.5	−0 27 31.0	+5 40.5	9.857 9508	−733
3	71 25 8.6	1 36 38.4	0 28.6	0 16 7.6	5 42.8	9.857 8064	711
5	74 38 29.1	1 36 42.1	−0 8.3	−0 4 40.7	5 44.0	9.857 6667	686
7	77 51 56.8	1 36 45.6	+0 12.1	+0 6 47.6	5 44.1	9.857 5322	659
9	81 5 31.6	1 36 49.2	0 32.3	0 18 14.9	5 43.1	9.857 4033	630
11	84 19 13.6	1 36 52.8	+0 52.1	+0 29 39.2	+5 41.0	9.857 2805	−599
13	87 33 2.7	1 36 56.3	1 11.3	0 40 58.2	5 37.8	9.857 1640	566
15	90 46 58.8	1 36 59.8	1 29.6	0 52 9.8	5 33.6	9.857 0544	530
17	94 1 1.7	1 37 3.1	1 46.8	1 3 11.7	5 28.2	9.856 9520	494
19	97 15 11.2	1 37 6.4	2 2.6	1 14 1.8	5 21.8	9.856 8571	455
21	100 29 27.2	1 37 9.5	+2 16.8	+1 24 38.1	+5 14.3	9.856 7701	−415
23	103 43 49.3	1 37 12.6	2 29.3	1 34 58.3	5 5.8	9.856 6911	374
25	106 58 17.5	1 37 15.5	2 39.9	1 45 0.6	4 56.2	9.856 6205	332
27	110 12 51.2	1 37 18.2	2 48.5	1 54 42.9	4 45.8	9.856 5585	288
29	113 27 30.2	1 37 20.8	2 54.9	2 4 3.3	4 34.4	9.856 5054	243
Dec. 1	116 42 14.1	1 37 23.1	+2 59.1	+2 12 59.9	+4 22.1	9.856 4612	−198
3	119 57 2.3	1 37 25.2	3 0.9	2 21 31.2	4 9.0	9.856 4262	152
5	123 11 54.6	1 37 27.0	3 0.5	2 29 35.2	3 55.0	9.856 4004	106
7	126 26 50.3	1 37 28.6	2 57.7	2 37 10.5	3 40.2	9.856 3840	59
9	129 41 48.9	1 37 29.9	2 52.6	2 44 15.5	3 24.8	9.856 3769	− 12
11	132 56 49.8	1 37 31.0	+2 45.3	+2 50 48.9	+3 8.6	9.856 3793	+ 36
13	136 11 52.5	1 37 31.7	2 35.9	2 56 49.3	2 51.8	9.856 3911	82
15	139 26 56.3	1 37 32.1	2 24.5	3 2 15.6	2 34.5	9.856 4122	129
17	142 42 0.6	1 37 32.2	2 11.3	3 7 6.8	2 16.6	9.856 4427	176
19	145 57 4.7	1 37 31.9	1 56.3	3 11 21.8	1 58.4	9.856 4824	221
21	149 12 7.8	1 37 31.2	+1 39.9	+3 15 0.0	+1 39.7	9.856 5311	+266
23	152 27 9.4	1 37 30.3	1 22.2	3 18 0.5	1 20.7	9.856 5887	310
25	155 42 8.7	1 37 29.0	1 3.4	3 20 22.8	1 1.5	9.856 6550	353
27	158 57 5.1	1 37 27.3	0 43.8	3 22 6.5	0 42.1	9.856 7298	395
29	162 11 57.7	1 37 25.2	0 23.7	3 23 11.3	0 22.6	9.856 8129	435
31	165 26 45.9	1 37 22.9	+0 3.2	+3 23 37.0	+0 3.1	9.856 9039	+474
33	168 41 29.1	1 37 20.2	−0 17.2	+3 23 23.6	−0 16.4	9.857 0028	+512

MARS, 1919.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
Jan. 1	20 49 8.35	+8.007	−19 0 7.8	+32.24	0.332 4354	+265.2	2.35	4.09	2 8.7
2	20 52 20.31	7.990	18 47 7.9	32.75	0.333 0707	264.2	2.35	4.09	2 8.0
3	20 55 31.85	7.972	18 33 55.9	33.25	0.333 7037	263.3	2.34	4.08	2 7.2
4	20 58 42.97	7.954	18 20 31.9	33.74	0.334 3343	262.2	2.34	4.07	2 6.5
5	21 1 53.64	7.936	18 6 56.3	34.23	0.334 9625	261.3	2.34	4.07	2 5.7
6	21 5 3.88	+7.917	−17 53 9.1	+34.70	0.335 5884	+260.3	2.33	4.06	2 4.9
7	21 8 13.67	7.899	17 39 10.7	35.17	0.336 2120	259.4	2.33	4.06	2 4.2
8	21 11 23.01	7.880	17 25 1.1	35.63	0.336 8333	258.4	2.32	4.05	2 3.4
9	21 14 31.89	7.860	17 10 40.6	36.08	0.337 4524	257.5	2.32	4.05	2 2.6
10	21 17 40.31	7.841	16 56 9.4	36.52	0.338 0693	256.6	2.32	4.04	2 1.8
11	21 20 48.28	+7.823	−16 41 27.8	+36.95	0.338 6842	+255.8	2.31	4.03	2 1.0
12	21 23 55.79	7.803	16 26 35.9	37.37	0.339 2972	255.0	2.31	4.03	2 0.1
13	21 27 2.84	7.784	16 11 33.9	37.79	0.339 9083	254.2	2.31	4.02	1 59.3
14	21 30 9.43	7.765	15 56 22.0	38.20	0.340 5176	253.5	2.31	4.02	1 58.5
15	21 33 15.57	7.746	15 41 0.4	38.60	0.341 1253	252.9	2.30	4.01	1 57.7
16	21 36 21.25	+7.727	−15 25 29.3	+38.99	0.341 7313	+252.2	2.30	4.01	1 56.8
17	21 39 26.48	7.709	15 9 48.9	39.37	0.342 3357	251.5	2.30	4.00	1 55.9
18	21 42 31.26	7.690	14 53 59.4	39.75	0.342 9385	250.8	2.30	4.00	1 55.1
19	21 45 35.59	7.671	14 38 0.9	40.12	0.343 5397	250.1	2.29	3.99	1 54.2
20	21 48 39.49	7.653	14 21 53.8	40.47	0.344 1392	249.5	2.28	3.98	1 53.3
21	21 51 42.95	+7.635	−14 5 38.2	+40.82	0.344 7371	+248.8	2.28	3.98	1 52.4
22	21 54 45.98	7.617	13 49 14.3	41.17	0.345 3334	248.1	2.28	3.97	1 51.5
23	21 57 48.58	7.600	13 32 42.3	41.50	0.345 9280	247.4	2.28	3.97	1 50.7
24	22 0 50.76	7.582	13 16 2.4	41.82	0.346 5209	246.7	2.27	3.96	1 49.8
25	22 3 52.51	7.564	12 59 14.9	42.14	0.347 1120	245.9	2.27	3.96	1 48.8
26	22 6 53.85	+7.547	−12 42 19.9	+42.45	0.347 7014	+245.2	2.27	3.95	1 47.9
27	22 9 54.77	7.530	12 25 17.6	42.74	0.348 2888	244.4	2.27	3.95	1 47.0
28	22 12 55.29	7.513	12 8 8.3	43.03	0.348 8743	243.5	2.26	3.94	1 46.1
29	22 15 55.40	7.496	11 50 52.2	43.31	0.349 4578	242.7	2.26	3.94	1 45.1
30	22 18 55.11	7.480	11 33 29.5	43.58	0.350 0393	241.9	2.26	3.93	1 44.2
31	22 21 54.43	+7.463	−11 16 0.4	+43.84	0.350 6187	+241.0	2.26	3.93	1 43.2
Feb. 1	22 24 53.35	7.447	10 58 25.2	44.09	0.351 1960	240.1	2.25	3.92	1 42.3
2	22 27 51.89	7.431	10 40 44.1	44.33	0.351 7713	239.3	2.24	3.91	1 41.3
3	22 30 50.04	7.415	10 22 57.3	44.57	0.352 3444	238.4	2.24	3.91	1 40.3
4	22 33 47.82	7.399	10 5 5.0	44.79	0.352 9154	237.5	2.24	3.90	1 39.3
5	22 36 45.21	+7.383	− 9 47 7.4	+45.01	0.353 4842	+236.5	2.24	3.90	1 38.3
6	22 39 42.23	7.368	9 29 4.8	45.21	0.354 0508	235.6	2.23	3.89	1 37.3
7	22 42 38.88	7.353	9 10 57.3	45.41	0.354 6152	234.7	2.23	3.89	1 36.3
8	22 45 35.17	7.338	8 52 45.3	45.59	0.355 1776	233.9	2.23	3.88	1 35.3
9	22 48 31.11	7.323	8 34 28.9	45.77	0.355 7381	233.1	2.23	3.88	1 34.3
10	22 51 26.69	+7.309	− 8 16 8.3	+45.94	0.356 2966	+232.3	2.22	3.87	1 33.3
11	22 54 21.93	7.295	7 57 43.7	46.11	0.356 8532	231.5	2.22	3.87	1 32.3
12	22 57 16.84	7.281	7 39 15.3	46.26	0.357 4080	230.8	2.22	3.86	1 31.3
13	23 0 11.42	7.267	7 20 43.3	46.41	0.357 9610	230.0	2.22	3.86	1 30.2
14	23 3 5.68	7.254	7 2 7.9	46.54	0.358 5122	229.3	2.21	3.85	1 29.2
15	23 5 59.64	+7.242	− 6 43 29.3	+46.67	0.359 0617	+228.6	2.21	3.85	1 28.2
16	23 8 53.29	+7.230	− 6 24 47.8	+46.79	0.359 6093	+227.8	2.20	3.84	1 27.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
Feb. 16	23 8 53.29	+7.230	−6 24 47.8	+46.79	0.359 6093	+227.8	2.20	3.84	1 27.1
17	23 11 46.66	7.218	6 6 3.3	46.91	0.360 1551	227.0	2.20	3.84	1 26.1
18	23 14 39.74	7.206	5 47 16.3	47.01	0.360 6991	226.3	2.20	3.84	1 25.0
19	23 17 32.55	7.195	5 28 26.9	47.11	0.361 2412	225.5	2.20	3.83	1 23.9
20	23 20 25.10	7.184	5 9 35.2	47.20	0.361 7813	224.6	2.20	3.83	1 22.9
21	23 23 17.40	+7.174	−4 50 41.5	+47.28	0.362 3195	+223.8	2.19	3.82	1 21.8
22	23 26 9.45	7.164	4 31 45.9	47.35	0.362 8557	223.0	2.19	3.82	1 20.7
23	23 29 1.26	7.154	4 12 48.7	47.42	0.363 3898	222.1	2.19	3.81	1 19.7
24	23 31 52.85	7.145	3 53 49.9	47.47	0.363 9218	221.1	2.19	3.81	1 18.6
25	23 34 44.21	7.136	3 34 50.0	47.52	0.364 4514	220.2	2.18	3.80	1 17.5
26	23 37 35.37	+7.128	−3 15 49.0	+47.56	0.364 9788	+219.3	2.18	3.80	1 16.4
27	23 40 26.33	7.119	2 56 47.1	47.59	0.365 5038	218.3	2.18	3.79	1 15.3
28	23 43 17.09	7.111	2 37 44.6	47.62	0.366 0264	217.2	2.18	3.79	1 14.2
Mar. 1	23 46 7.66	7.103	2 18 41.6	47.63	0.366 5463	216.1	2.17	3.78	1 13.1
2	23 48 58.05	7.096	1 59 38.4	47.64	0.367 0636	215.0	2.17	3.78	1 12.0
3	23 51 48.27	+7.089	−1 40 35.1	+47.64	0.367 5782	+213.9	2.16	3.77	1 10.9
4	23 54 38.32	7.082	1 21 31.9	47.63	0.368 0901	212.7	2.16	3.77	1 9.8
5	23 57 28.20	7.075	1 2 29.1	47.61	0.368 5993	211.6	2.16	3.77	1 8.7
6	0 0 17.93	7.069	0 43 26.8	47.58	0.369 1057	210.4	2.16	3.76	1 7.6
7	0 3 7.50	7.063	0 24 25.3	47.54	0.369 6094	209.3	2.16	3.76	1 6.5
8	0 5 56.94	+7.057	−0 5 24.7	+47.50	0.370 1103	+208.2	2.15	3.75	1 5.3
9	0 8 46.24	7.052	+0 13 34.8	47.45	0.370 6086	207.1	2.15	3.75	1 4.2
10	0 11 35.42	7.047	0 32 33.0	47.39	0.371 1042	206.0	2.15	3.74	1 3.1
11	0 14 24.48	7.042	0 51 29.7	47.33	0.371 5972	204.8	2.15	3.74	1 2.0
12	0 17 13.44	7.038	1 10 24.9	47.26	0.372 0875	203.7	2.15	3.74	1 0.8
13	0 20 2.29	+7.033	+1 29 18.2	+47.18	0.372 5752	+202.7	2.14	3.73	0 59.7
14	0 22 51.04	7.029	1 48 9.5	47.10	0.373 0603	201.6	2.14	3.73	0 58.6
15	0 25 39.71	7.026	2 6 58.7	47.00	0.373 5427	200.5	2.14	3.72	0 57.5
16	0 28 28.31	7.024	2 25 45.5	46.90	0.374 0226	199.4	2.14	3.72	0 56.3
17	0 31 16.85	7.021	2 44 29.9	46.79	0.374 4998	198.3	2.14	3.72	0 55.2
18	0 34 5.33	+7.019	+3 3 11.5	+46.68	0.374 9744	+197.2	2.13	3.71	0 54.1
19	0 36 53.77	7.017	3 21 50.3	46.56	0.375 4465	196.1	2.13	3.71	0 52.9
20	0 39 42.17	7.016	3 40 26.2	46.43	0.375 9158	195.0	2.12	3.70	0 51.8
21	0 42 30.54	7.015	3 58 58.9	46.29	0.376 3823	193.8	2.12	3.70	0 50.7
22	0 45 18.90	7.015	4 17 28.3	46.16	0.376 8458	192.5	2.12	3.70	0 49.5
23	0 48 7.24	+7.014	+4 35 54.3	+46.01	0.377 3063	+191.3	2.12	3.69	0 48.4
24	0 50 55.59	7.015	4 54 16.6	45.85	0.377 7638	190.0	2.12	3.69	0 47.2
25	0 53 43.94	7.015	5 12 35.1	45.69	0.378 2182	188.7	2.11	3.68	0 46.1
26	0 56 32.30	7.016	5 30 49.6	45.52	0.378 6693	187.3	2.11	3.68	0 45.0
27	0 59 20.69	7.017	5 49 0.1	45.35	0.379 1172	185.9	2.11	3.68	0 43.8
28	1 2 9.11	+7.018	+6 7 6.3	+45.17	0.379 5617	+184.5	2.11	3.67	0 42.7
29	1 4 57.56	7.020	6 25 8.0	44.97	0.380 0027	183.0	2.11	3.67	0 41.6
30	1 7 46.06	7.022	6 43 4.9	44.77	0.380 4401	181.5	2.11	3.67	0 40.4
31	1 10 34.61	7.024	7 0 57.0	44.57	0.380 8738	179.9	2.10	3.66	0 39.3
Apr. 1	1 13 23.21	7.026	7 18 44.0	44.35	0.381 3038	178.4	2.10	3.66	0 38.2
2	1 16 11.87	+7.029	+7 36 25.9	+44.14	0.381 7300	+176.8	2.10	3.65	0 37.1
3	1 19 0.59	+7.031	+7 54 2.5	+43.91	0.382 1524	+175.2	2.10	3.65	0 35.9

MARS, 1919.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diam-eter.	Hor. Paral-lax.	Transit, Meridian of Green-wich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Apr. 1	1 13 23.21	+7.026	+ 7 18 44.0	+44.35	0.381 3038	+178.4	2.10	3.66	0 38.2
2	1 16 11.87	7.029	7 36 25.9	44.14	0.381 7300	176.8	2.10	3.65	0 37.1
3	1 19 0.59	7.031	7 54 2.5	43.91	0.382 1524	175.2	2.10	3.65	0 35.9
4	1 21 49.37	7.034	8 11 33.7	43.68	0.382 5709	173.6	2.10	3.65	0 34.8
5	1 24 38.22	7.037	8 28 59.2	43.44	0.382 9856	172.0	2.09	3.64	0 33.7
6	1 27 27.14	+7.040	+ 8 46 18.9	+43.20	0.383 3965	+170.4	2.09	3.64	0 32.5
7	1 30 16.15	7.044	9 3 32.7	42.95	0.383 8035	168.8	2.09	3.64	0 31.4
8	1 33 5.24	7.047	9 20 40.4	42.69	0.384 2066	167.2	2.08	3.63	0 30.3
9	1 35 54.42	7.051	9 37 41.8	42.43	0.384 6059	165.6	2.08	3.63	0 29.2
10	1 38 43.70	7.056	9 54 36.9	42.16	0.385 0015	164.0	2.08	3.63	0 28.0
11	1 41 33.09	+7.060	+10 11 25.4	+41.88	0.385 3932	+162.4	2.08	3.62	0 26.9
12	1 44 22.58	7.064	10 28 7.2	41.60	0.385 7812	160.9	2.08	3.62	0 25.8
13	1 47 12.19	7.070	10 44 42.2	41.32	0.386 1653	159.3	2.08	3.62	0 24.7
14	1 50 1.93	7.075	11 1 10.3	41.02	0.386 5457	157.7	2.07	3.61	0 23.6
15	1 52 51.79	7.080	11 17 31.2	40.72	0.386 9221	156.1	2.07	3.61	0 22.5
16	1 55 41.79	+7.087	+11 33 45.0	+40.42	0.387 2948	+154.5	2.07	3.61	0 21.4
17	1 58 31.94	7.092	11 49 51.3	40.11	0.387 6634	152.7	2.07	3.60	0 20.3
18	2 1 22.22	7.098	12 5 50.2	39.80	0.388 0279	151.0	2.07	3.60	0 19.2
19	2 4 12.66	7.105	12 21 41.5	39.48	0.388 3882	149.2	2.07	3.60	0 18.0
20	2 7 3.25	7.111	12 37 25.0	39.15	0.388 7441	147.4	2.07	3.60	0 16.9
21	2 9 54.01	+7.119	+12 53 0.7	+38.82	0.389 0958	+145.7	2.06	3.59	0 15.9
22	2 12 44.94	7.125	13 8 28.2	38.48	0.389 4433	143.9	2.06	3.59	0 14.8
23	2 15 36.03	7.133	13 23 47.6	38.14	0.389 7865	142.2	2.06	3.59	0 13.7
24	2 18 27.31	7.140	13 38 58.7	37.79	0.390 1258	140.4	2.05	3.58	0 12.6
25	2 21 18.76	7.147	13 54 1.3	37.43	0.390 4604	138.5	2.05	3.58	0 11.5
26	2 24 10.39	+7.155	+14 8 55.5	+37.08	0.390 7903	+136.4	2.05	3.58	0 10.4
27	2 27 2.20	7.163	14 23 40.9	36.71	0.391 1151	134.3	2.05	3.58	0 9.3
28	2 29 54.20	7.171	14 38 17.6	36.34	0.391 4348	132.1	2.05	3.57	0 8.3
29	2 32 46.39	7.178	14 52 45.3	35.97	0.391 7493	130.0	2.05	3.57	0 7.2
30	2 35 38.76	7.186	15 7 3.9	35.58	0.392 0588	127.9	2.05	3.57	0 6.1
May 1	2 38 31.31	+7.194	+15 21 13.3	+35.20	0.392 3631	+125.7	2.05	3.57	0 5.1
2	2 41 24.06	7.201	15 35 13.3	34.80	0.392 6623	123.6	2.04	3.56	0 4.0
3	2 44 16.98	7.209	15 49 3.8	34.41	0.392 9563	121.4	2.04	3.56	0 2.9
4	2 47 10.09	7.217	16 2 44.8	34.01	0.393 2452	119.3	2.04	3.56	0 1.9
5	2 50 3.37	7.224	16 16 16.1	33.60	0.393 5289	117.2	2.04	3.56	0 0.8 23 59.8
6	2 52 56.83	+7.231	+16 29 37.6	+33.19	0.393 8076	+115.1	2.04	3.55	23 58.7
7	2 55 50.48	7.239	16 42 49.1	32.77	0.394 0811	112.8	2.04	3.55	23 57.7
8	2 58 44.31	7.247	16 55 50.6	32.35	0.394 3492	110.6	2.04	3.55	23 56.6
9	3 1 38.33	7.255	17 8 41.9	31.92	0.394 6119	108.3	2.04	3.55	23 55.6
10	3 4 32.53	7.262	17 21 22.9	31.49	0.394 8690	106.0	2.03	3.54	23 54.5
11	3 7 26.92	+7.270	+17 33 53.6	+31.06	0.395 1207	+103.8	2.03	3.54	23 53.5
12	3 10 21.49	7.278	17 46 13.9	30.63	0.395 3673	101.7	2.03	3.54	23 52.5
13	3 13 16.26	7.286	17 58 23.6	30.19	0.395 6088	99.6	2.03	3.54	23 51.4
14	3 16 11.23	7.294	18 10 22.8	29.74	0.395 8452	97.4	2.03	3.54	23 50.4
15	3 19 6.38	7.302	18 22 11.1	29.29	0.396 0763	95.2	2.03	3.53	23 49.4
16	3 22 1.71	+7.309	+18 33 48.7	+28.84	0.396 3020	+ 92.9	2.03	3.53	23 48.4
17	3 24 57.21	+7.316	+18 45 15.2	+28.38	0.396 5223	+ 90.7	2.03	3.53	23 47.4

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
		h m s	s	° ′ ″	″			″	″	h m
May	17	3 24 57.21	+7.316	+18 45 15.2	+28.38	0.396 5223	+90.7	2.03	3.53	23 47.4
	18	3 27 52.88	7.323	18 56 30.7	27.91	0.396 7371	88.3	2.03	3.53	23 46.4
	19	3 30 48.74	7.331	19 7 35.0	27.45	0.396 9463	86.0	2.03	3.53	23 45.4
	20	3 33 44.78	7.339	19 18 28.2	26.98	0.397 1498	83.6	2.03	3.53	23 44.4
	21	3 36 41.01	7.347	19 29 10.0	26.51	0.397 3476	81.2	2.03	3.53	23 43.4
	22	3 39 37.43	+7.354	+19 39 40.5	+26.03	0.397 5397	+78.8	2.02	3.52	23 42.4
	23	3 42 34.02	7.362	19 49 59.5	25.55	0.397 7258	76.2	2.02	3.52	23 41.4
	24	3 45 30.79	7.369	20 0 7.0	25.07	0.397 9055	73.6	2.02	3.52	23 40.4
	25	3 48 27.73	7.376	20 10 2.9	24.59	0.398 0789	70.9	2.02	3.52	23 39.4
	26	3 51 24.83	7.383	20 19 47.1	24.10	0.398 2457	68.1	2.02	3.52	23 38.4
	27	3 54 22.10	+7.389	+20 29 19.5	+23.60	0.398 4060	+65.4	2.02	3.52	23 37.4
	28	3 57 19.51	7.395	20 38 40.1	23.11	0.398 5597	62.7	2.01	3.51	23 36.5
	29	4 0 17.07	7.402	20 47 48.7	22.61	0.398 7069	60.0	2.01	3.51	23 35.5
	30	4 3 14.78	7.407	20 56 45.3	22.11	0.398 8476	57.2	2.01	3.51	23 34.5
	31	4 6 12.61	7.412	21 5 29.9	21.60	0.398 9816	54.5	2.01	3.51	23 33.5
June	1	4 9 10.57	+7.417	+21 14 2.2	+21.09	0.399 1090	+51.7	2.01	3.51	23 32.5
	2	4 12 8.64	7.422	21 22 22.4	20.59	0.399 2297	48.9	2.01	3.51	23 31.5
	3	4 15 6.82	7.427	21 30 30.3	20.07	0.399 3436	46.1	2.01	3.51	23 30.6
	4	4 18 5.11	7.431	21 38 25.9	19.56	0.399 4508	43.3	2.01	3.51	23 29.6
	5	4 21 3.50	7.435	21 46 9.1	19.04	0.399 5513	40.5	2.01	3.51	23 28.6
	6	4 24 1.97	+7.438	+21 53 39.9	+18.53	0.399 6450	+37.6	2.01	3.51	23 27.7
	7	4 27 0.53	7.442	22 0 58.3	18.01	0.399 7320	34.8	2.01	3.51	23 26.7
	8	4 29 59.18	7.445	22 8 4.2	17.48	0.399 8122	32.0	2.01	3.50	23 25.7
	9	4 32 57.90	7.448	22 14 57.5	16.96	0.399 8856	29.2	2.01	3.50	23 24.8
	10	4 35 56.68	7.451	22 21 38.2	16.43	0.399 9523	26.4	2.01	3.50	23 23.8
	11	4 38 55.53	+7.453	+22 28 6.3	+15.91	0.400 0122	+23.5	2.01	3.50	23 22.8
	12	4 41 54.44	7.456	22 34 21.8	15.38	0.400 0652	20.6	2.01	3.50	23 21.9
	13	4 44 53.40	7.458	22 40 24.5	14.85	0.400 1113	17.8	2.01	3.50	23 20.9
	14	4 47 52.41	7.459	22 46 14.5	14.32	0.400 1505	14.9	2.01	3.50	23 20.0
	15	4 50 51.45	7.461	22 51 51.8	13.79	0.400 1827	11.9	2.01	3.50	23 19.0
	16	4 53 50.53	+7.462	+22 57 16.2	+13.25	0.400 2078	+ 8.9	2.01	3.50	23 18.1
	17	4 56 49.63	7.463	23 2 27.9	12.72	0.400 2256	5.9	2.01	3.50	23 17.1
	18	4 59 48.75	7.464	23 7 26.8	12.19	0.400 2362	+ 2.9	2.01	3.50	23 16.2
	19	5 2 47.89	7.464	23 12 12.9	11.65	0.400 2393	− 0.2	2.01	3.50	23 15.2
	20	5 5 47.03	7.464	23 16 46.1	11.11	0.400 2350	3.4	2.01	3.50	23 14.3
	21	5 8 46.17	+7.464	+23 21 6.4	+10.58	0.400 2230	− 6.6	2.01	3.50	23 13.3
	22	5 11 45.29	7.463	23 25 13.8	10.04	0.400 2034	9.8	2.01	3.50	23 12.4
	23	5 14 44.39	7.462	23 29 8.4	9.51	0.400 1761	13.0	2.01	3.50	23 11.4
	24	5 17 43.47	7.461	23 32 50.1	8.97	0.400 1409	16.3	2.01	3.50	23 10.4
	25	5 20 42.50	7.458	23 36 19.0	8.43	0.400 0976	19.7	2.01	3.50	23 9.5
	26	5 23 41.47	+7.456	+23 39 34.9	+ 7.90	0.400 0461	−23.2	2.01	3.50	23 8.5
	27	5 26 40.39	7.453	23 42 38.0	7.36	0.399 9863	26.6	2.01	3.50	23 7.5
	28	5 29 39.23	7.450	23 45 28.2	6.82	0.399 9183	30.1	2.01	3.50	23 6.6
	29	5 32 37.98	7.446	23 48 5.6	6.29	0.399 8420	33.5	2.01	3.50	23 5.6
	30	5 35 36.64	7.442	23 50 30.1	5.75	0.399 7574	37.0	2.01	3.50	23 4.6
July	1	5 38 35.19	+7.437	+23 52 41.8	+ 5.22	0.399 6645	−40.4	2.01	3.51	23 3.7
	2	5 41 33.63	+7.432	+23 54 40.7	+ 4.69	0.399 5633	−43.9	2.01	3.51	23 2.7

MARS, 1919.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.	Var. per Hour. Noon.	Apparent Declination. Noon.	Var. per Hour. Noon.	Logarithm of Distance from Earth. Noon.	Var. per Hour. Noon.	Semi-diameter. Noon.	Hor. Parallax. Noon.	Transit, Meridian of Greenwich.
	h m s	s	° ′ ″	″			″	″	h m
July 1	5 38 35.19	+7.437	+23 52 41.8	+ 5.22	0.399 6645	− 40.4	2.01	3.51	23 3.7
2	5 41 33.63	7.432	23 54 40.7	4.69	0.399 5633	43.9	2.01	3.51	23 2.7
3	5 44 31.93	7.426	23 56 26.8	4.16	0.399 4538	47.3	2.01	3.51	23 1.7
4	5 47 30.10	7.421	23 58 0.2	3.63	0.399 3360	50.8	2.01	3.51	23 0.8
5	5 50 28.12	7.414	23 59 20.9	3.10	0.399 2097	54.4	2.01	3.51	22 59.8
6	5 53 25.99	+7.408	+24 0 28.9	+ 2.57	0.399 0750	− 57.9	2.01	3.51	22 58.8
7	5 56 23.70	7.401	24 1 24.3	2.04	0.398 9320	61.4	2.01	3.51	22 57.8
8	5 59 21.23	7.393	24 2 7.0	1.52	0.398 7805	64.9	2.01	3.51	22 56.9
9	6 2 18.58	7.386	24 2 37.1	0.99	0.398 6206	68.4	2.01	3.51	22 55.9
10	6 5 15.74	7.378	24 2 54.7	+ 0.47	0.398 4522	71.9	2.02	3.52	22 54.9
11	6 8 12.72	+7.370	+24 2 59.8	− 0.05	0.398 2753	− 75.5	2.02	3.52	22 53.9
12	6 11 9.49	7.362	24 2 52.4	0.57	0.398 0898	79.1	2.02	3.52	22 52.8
13	6 14 6.07	7.353	24 2 32.5	1.09	0.397 8957	82.7	2.02	3.52	22 51.8
14	6 17 2.43	7.344	24 2 0.3	1.60	0.397 6930	86.3	2.02	3.52	22 50.8
15	6 19 58.57	7.335	24 1 15.7	2.11	0.397 4814	90.0	2.02	3.52	22 49.8
16	6 22 54.49	+7.325	+24 0 18.9	− 2.62	0.397 2609	− 93.7	2.03	3.53	22 48.8
17	6 25 50.17	7.315	23 59 9.9	3.13	0.397 0315	97.5	2.03	3.53	22 47.8
18	6 28 45.60	7.304	23 57 48.7	3.63	0.396 7930	101.3	2.03	3.53	22 46.8
19	6 31 40.78	7.294	23 56 15.5	4.14	0.396 5452	105.2	2.03	3.53	22 45.8
20	6 34 35.69	7.282	23 54 30.2	4.64	0.396 2882	109.1	2.03	3.53	22 44.8
21	6 37 30.33	+7.271	+23 52 33.0	− 5.13	0.396 0217	−113.0	2.03	3.54	22 43.7
22	6 40 24.70	7.260	23 50 23.8	5.63	0.395 7456	117.1	2.03	3.54	22 42.7
23	6 43 18.79	7.248	23 48 2.9	6.12	0.395 4598	121.1	2.03	3.54	22 41.6
24	6 46 12.58	7.235	23 45 30.2	6.61	0.395 1643	125.2	2.03	3.54	22 40.6
25	6 49 6.09	7.223	23 42 45.8	7.09	0.394 8589	129.3	2.03	3.54	22 39.5
26	6 51 59.29	+7.210	+23 39 49.9	− 7.57	0.394 5436	−133.4	2.04	3.55	22 38.5
27	6 54 52.17	7.196	23 36 42.4	8.05	0.394 2183	137.6	2.04	3.55	22 37.4
28	6 57 44.71	7.182	23 33 23.4	8.53	0.393 8830	141.8	2.04	3.55	22 36.3
29	7 0 36.91	7.168	23 29 53.1	9.00	0.393 5375	146.0	2.04	3.56	22 35.3
30	7 3 28.76	7.153	23 26 11.6	9.46	0.393 1820	150.2	2.04	3.56	22 34.2
31	7 6 20.26	+7.138	+23 22 18.9	− 9.93	0.392 8164	−154.4	2.04	3.56	22 33.1
Aug. 1	7 9 11.39	7.123	23 18 15.2	10.38	0.392 4407	158.7	2.05	3.57	22 32.0
2	7 12 2.16	7.108	23 14 0.6	10.83	0.392 0548	162.9	2.05	3.57	22 30.9
3	7 14 52.55	7.092	23 9 35.2	11.29	0.391 6588	167.1	2.05	3.57	22 29.8
4	7 17 42.56	7.076	23 4 58.9	11.74	0.391 2525	171.4	2.05	3.57	22 28.7
5	7 20 32.19	+7.060	+23 0 11.9	−12.18	0.390 8361	−175.6	2.05	3.58	22 27.5
6	7 23 21.43	7.044	22 55 14.3	12.62	0.390 4094	179.9	2.05	3.58	22 26.4
7	7 26 10.29	7.027	22 50 6.1	13.06	0.389 9724	184.2	2.05	3.58	22 25.3
8	7 28 58.74	7.010	22 44 47.5	13.49	0.389 5251	188.5	2.06	3.59	22 24.1
9	7 31 46.79	6.994	22 39 18.6	13.92	0.389 0674	192.8	2.06	3.59	22 23.0
10	7 34 34.45	+6.977	+22 33 39.4	−14.35	0.388 5994	−197.2	2.07	3.60	22 21.8
11	7 37 21.70	6.960	22 27 50.0	14.77	0.388 1208	201.6	2.07	3.60	22 20.6
12	7 40 8.54	6.943	22 21 50.6	15.18	0.387 6317	206.0	2.07	3.60	22 19.5
13	7 42 54.97	6.926	22 15 41.3	15.59	0.387 1320	210.4	2.07	3.61	22 18.3
14	7 45 40.99	6.909	22 9 22.1	16.00	0.386 6216	214.9	2.07	3.61	22 17.2
15	7 48 26.59	+6.892	+22 2 53.2	−16.40	0.386 1002	−219.5	2.08	3.62	22 16.0
16	7 51 11.78	+6.874	+21 56 14.7	−16.80	0.385 5678	−224.1	2.08	3.62	22 14.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.	Var. per Hour. Noon.	Apparent Declination. Noon.	Var. per Hour. Noon.	Logarithm of Distance from Earth. Noon.	Var. per Hour. Noon.	Semi-diameter. Noon.	Hor. Parallax. Noon.	Transit, Meridian of Greenwich.
	h m s	s	° ′ ″	″			″	″	h m
ug. 16	7 51 11.78	+6.874	+21 56 14.7	−16.80	0.385 5678	−224.1	2.08	3.62	22 14.8
17	7 53 56.54	6.856	21 49 26.7	17.20	0.385 0243	228.8	2.08	3.63	22 13.6
18	7 56 40.88	6.839	21 42 29.2	17.59	0.384 4696	233.5	2.08	3.63	22 12.3
19	7 59 24.79	6.821	21 35 22.5	17.97	0.383 9034	238.3	2.09	3.64	22 11.1
20	8 2 8.27	6.803	21 28 6.5	18.36	0.383 3256	243.2	2.09	3.64	22 9.9
21	8 4 51.32	+6.785	+21 20 41.4	−18.73	0.382 7362	−248.0	2.10	3.65	22 8.7
22	8 7 33.93	6.766	21 13 7.4	19.10	0.382 1350	253.0	2.10	3.65	22 7.5
23	8 10 16.09	6.747	21 5 24.5	19.47	0.381 5220	257.9	2.10	3.66	22 6.2
24	8 12 57.80	6.729	20 57 32.9	19.83	0.380 8971	262.9	2.10	3.66	22 4.9
25	8 15 39.07	6.710	20 49 32.8	20.18	0.380 2601	267.9	2.11	3.67	22 3.7
26	8 18 19.88	+6.691	+20 41 24.1	−20.54	0.379 6111	−272.9	2.11	3.67	22 2.4
27	8 21 0.24	6.672	20 33 7.1	20.88	0.378 9500	278.0	2.11	3.68	22 1.1
28	8 23 40.13	6.652	20 24 41.9	21.22	0.378 2767	283.0	2.11	3.68	21 59.8
29	8 26 19.55	6.633	20 16 8.6	21.55	0.377 5914	288.1	2.12	3.69	21 58.5
30	8 28 58.51	6.614	20 7 27.3	21.88	0.376 8939	293.2	2.12	3.69	21 57.2
31	8 31 37.00	+6.594	+19 58 38.2	−22.21	0.376 1842	−298.2	2.12	3.70	21 55.9
pt. 1	8 34 15.02	6.575	19 49 41.2	22.53	0.375 4623	303.3	2.13	3.71	21 54.6
2	8 36 52.58	6.555	19 40 36.6	22.85	0.374 7282	308.5	2.13	3.71	21 53.3
3	8 39 29.67	6.536	19 31 24.4	23.16	0.373 9817	313.6	2.14	3.72	21 52.0
4	8 42 6.30	6.516	19 22 4.8	23.47	0.373 2229	318.7	2 14	3.73	21 50.6
5	8 44 42.46	+6.497	+19 12 37.9	−23.77	0.372 4518	−323.9	2.14	3.73	21 49.3
6	8 47 18.16	6.478	19 3 3.8	24.07	0.371 6682	329.1	2.15	3.74	21 47.9
7	8 49 53.39	6.458	18 53 22.6	24.36	0.370 8721	334.3	2.15	3.75	21 46.6
8	8 52 28.16	6.439	18 43 34.5	24.65	0.370 0635	339.5	2.15	3.75	21 45.2
9	8 55 2.48	6.421	18 33 39.5	24.93	0.369 2423	344.8	2.16	3.76	21 43.9
10	8 57 36.35	+6.402	+18 23 37.7	−25.21	0.368 4084	−350.1	2.16	3.77	21 42.5
11	9 0 9.76	6.383	18 13 29.3	25.49	0.367 5617	355.5	2.16	3.77	21 41.1
12	9 2 42.73	6.364	18 3 14.3	25.76	0.366 7021	360.9	2.17	3.78	21 39.7
13	9 5 15.24	6.345	17 52 52.9	26.02	0.365 8293	366.4	2.18	3.79	21 38.3
14	9 7 47.30	6.327	17 42 25.2	26.28	0.364 9433	371.9	2.18	3.80	21 36.8
15	9 10 18.92	+6.308	+17 31 51.3	−26.54	0.364 0439	−377.6	2.19	3.81	21 35.4
16	9 12 50.09	6.290	17 21 11.3	26.79	0.363 1309	383.3	2.19	3.81	21 34.0
17	9 15 20.82	6.271	17 10 25.3	27.04	0.362 2042	389.0	2.19	3.82	21 32.6
18	9 17 51.10	6.252	16 59 33.6	27.27	0.361 2636	394.8	2.20	3.83	21 31.1
19	9 20 20.94	6.234	16 48 36.2	27.51	0.360 3090	400.7	2.20	3.84	21 29.7
20	9 22 50.34	+6.216	+16 37 33.2	−27.74	0.359 3403	−406.6	2.21	3.85	21 28.2
21	9 25 19.29	6.197	16 26 24.8	27.96	0.358 3575	412.5	2.22	3.86	21 26.8
22	9 27 47.80	6.179	16 15 11.1	28.18	0.357 3605	418.4	2.22	3.86	21 25.3
23	9 30 15.86	6.160	16 3 52.2	28.39	0.356 3492	424.4	2.22	3.87	21 23.8
24	9 32 43.47	6.141	15 52 28.3	28.60	0.355 3235	430.4	2.23	3.88	21 22.3
25	9 35 10.64	+6.123	+15 40 59.4	−28.80	0.354 2833	−436.4	2.23	3.89	21 20.8
26	9 37 37.37	6.105	15 29 25.8	29.00	0.353 2287	442.5	2.24	3.90	21 19.3
27	9 40 3.66	6.086	15 17 47.5	29.19	0.352 1595	448.5	2.24	3.91	21 17.8
28	9 42 29.51	6.068	15 6 4.6	29.38	0.351 0758	454.6	2.25	3.92	21 16.3
29	9 44 54.91	6.049	14 54 17.2	29.57	0.349 9774	460.7	2.26	3.93	21 14.8
30	9 47 19.88	+6.031	+14 42 25.5	−29.74	0.348 8643	−466.8	2.26	3.94	21 13.2
ct. 1	9 49 44.42	+6.013	+14 30 29.6	−29.92	0.347 7365	−473.0	2.27	3.95	21 11.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Oct. 1	9 49 44.42	+6.013	+14 30 29.6	−29.92	0.347 7365	−473.0	2.27	3.95	21 11.7
2	9 52 8.52	5.995	14 18 29.5	30.09	0.346 5939	479.1	2.27	3.96	21 10.1
3	9 54 32.20	5.978	14 6 25.5	30.25	0.345 4366	485.3	2.28	3.97	21 8.6
4	9 56 55.45	5.960	13 54 17.5	30.41	0.344 2644	491.5	2.28	3.98	21 7.0
5	9 59 18.28	5.943	13 42 5.7	30.57	0.343 0774	497.7	2.29	3.99	21 5.5
6	10 1 40.70	+5.926	+13 29 50.3	−30.72	0.341 8754	−504.0	2.30	4.00	21 3.9
7	10 4 2.71	5.909	13 17 31.2	30.87	0.340 6584	510.2	2.31	4.02	21 2.3
8	10 6 24.31	5.892	13 5 8.7	31.01	0.339 4263	516.6	2.31	4.03	21 0.7
9	10 8 45.51	5.875	12 52 42.8	31.15	0.338 1789	522.9	2.32	4.04	20 59.1
10	10 11 6.31	5.858	12 40 13.6	31.28	0.336 9161	529.4	2.32	4.05	20 57.5
11	10 13 26.72	+5.842	+12 27 41.2	−31.41	0.335 6377	−535.9	2.33	4.06	20 55.9
12	10 15 46.74	5.826	12 15 5.8	31.54	0.334 3436	542.5	2.34	4.08	20 54.3
13	10 18 6.37	5.810	12 2 27.4	31.66	0.333 0336	549.2	2.35	4.09	20 52.7
14	10 20 25.62	5.794	11 49 46.1	31.76	0.331 7075	555.9	2.35	4.10	20 51.1
15	10 22 44.48	5.778	11 37 2.2	31.88	0.330 3652	562.7	2.36	4.11	20 49.5
16	10 25 2.96	+5.762	+11 24 15.7	−31.99	0.329 0065	−569.6	2.37	4.13	20 47.8
17	10 27 21.06	5.746	11 11 26.8	32.09	0.327 6313	576.4	2.38	4.14	20 46.2
18	10 29 38.78	5.731	10 58 35.5	32.18	0.326 2395	583.4	2.38	4.15	20 44.5
19	10 31 56.13	5.715	10 45 42.0	32.28	0.324 8307	590.5	2.39	4.17	20 42.8
20	10 34 13.10	5.699	10 32 46.3	32.36	0.323 4049	597.7	2.40	4.18	20 41.2
21	10 36 29.70	+5.684	+10 19 48.6	−32.44	0.321 9619	−604.8	2.41	4.19	20 39.5
22	10 38 45.91	5.668	10 6 49.1	32.52	0.320 5018	612.0	2.42	4.21	20 37.9
23	10 41 1.75	5.652	9 53 47.8	32.59	0.319 0245	619.1	2.42	4.22	20 36.2
24	10 43 17.21	5.636	9 40 44.9	32.65	0.317 5300	626.3	2.43	4.24	20 34.5
25	10 45 32.30	5.621	9 27 40.5	32.71	0.316 0183	633.5	2.44	4.25	20 32.8
26	10 47 47.02	+5.605	+ 9 14 34.7	−32.77	0.314 4892	−640.8	2.45	4.27	20 31.1
27	10 50 1.36	5.590	9 1 27.6	32.82	0.312 9426	648.0	2.46	4.28	20 29.4
28	10 52 15.33	5.575	8 48 19.3	32.87	0.311 3786	655.3	2.47	4.30	20 27.7
29	10 54 28.94	5.559	8 35 9.9	32.91	0.309 7970	662.6	2.47	4.31	20 25.9
30	10 56 42.18	5.544	8 21 59.5	32.95	0.308 1979	670.0	2.48	4.33	20 24.2
31	10 58 55.06	+5.529	+ 8 8 48.2	−32.99	0.306 5811	−677.4	2.49	4.34	20 22.5
Nov. 1	11 1 7.58	5.514	7 55 36.2	33.02	0.304 9466	684.7	2.50	4.36	20 20.7
2	11 3 19.74	5.500	7 42 23.5	33.04	0.303 2944	692.1	2.51	4.38	20 19.0
3	11 5 31.56	5.485	7 29 10.2	33.07	0.301 6244	699.6	2.52	4.39	20 17.2
4	11 7 43.02	5.470	7 15 56.4	33.08	0.299 9365	707.1	2.53	4.41	20 15.5
5	11 9 54.13	+5.456	+ 7 2 42.2	−33.10	0.298 2305	−714.6	2.54	4.43	20 13.7
6	11 12 4.90	5.442	6 49 27.6	33.11	0.296 5065	722.2	2.55	4.45	20 12.0
7	11 14 15.34	5.428	6 36 12.8	33.12	0.294 7641	729.8	2.56	4.46	20 10.2
8	11 16 25.44	5.414	6 22 57.9	33.12	0.293 0032	737.6	2.57	4.48	20 8.4
9	11 18 35.21	5.400	6 9 43.0	33.12	0.291 2237	745.4	2.58	4.50	20 6.7
10	11 20 44.65	+5.387	+ 5 56 28.2	−33.11	0.289 4254	−753.3	2.59	4.52	20 4.9
11	11 22 53.77	5.373	5 43 13.6	33.11	0.287 6079	761.3	2.61	4.54	20 3.1
12	11 25 2.56	5.359	5 29 59.2	33.09	0.285 7713	769.3	2.62	4.56	20 1.3
13	11 27 11.02	5.346	5 16 45.3	33.07	0.283 9151	777.5	2.63	4.58	19 59.5
14	11 29 19.15	5.332	5 3 31.8	33.05	0.282 0393	785.7	2.64	4.60	19 57.7
15	11 31 26.95	+5.318	+ 4 50 19.0	−33.02	0.280 1437	−794.0	2.65	4.62	19 55.8
16	11 33 34.42	+5.304	+ 4 37 7.0	−32.98	0.278 2281	−802.3	2.66	4.64	19 54.0

MARS, 1919.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Paral-lax.	Transit, Meridian of Green-wich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Nov. 16	11 33 34.42	+5.304	+4 37 7.0	−32.98	0.278 2281	− 802.3	2.66	4.64	19 54.0
17	11 35 41.55	5.290	4 23 55.9	32.94	0.276 2925	810.7	2.67	4.66	19 52.2
18	11 37 48.36	5.277	4 10 45.8	32.90	0.274 3366	819.2	2.69	4.68	19 50.4
19	11 39 54.83	5.263	3 57 36.7	32.85	0.272 3605	827.6	2.70	4.70	19 48.5
20	11 42 0.96	5.248	3 44 28.9	32.80	0.270 3639	836.2	2.71	4.72	19 46.7
21	11 44 6.74	+5.234	+3 31 22.4	−32.74	0.268 3469	− 844.7	2.72	4.74	19 44.8
22	11 46 12.17	5.219	3 18 17.3	32.68	0.266 3092	853.3	2.74	4.77	19 43.0
23	11 48 17.26	5.205	3 5 13.7	32.62	0.264 2509	861.9	2.75	4.79	19 41.1
24	11 50 22.00	5.190	2 52 11.7	32.55	0.262 1719	870.6	2.76	4.81	19 39.3
25	11 52 26.40	5.176	2 39 11.5	32.47	0.260 0721	879.3	2.77	4.83	19 37.4
26	11 54 30.47	+5.162	+2 26 13.1	−32.39	0.257 9514	− 888.0	2.79	4.86	19 35.5
27	11 56 34.19	5.148	2 13 16.6	32.31	0.255 8099	896.7	2.80	4.88	19 33.6
28	11 58 37.55	5.133	2 0 22.1	32.23	0.253 6474	905.4	2.82	4.91	19 31.7
29	12 0 40.56	5.118	1 47 29.8	32.13	0.251 4639	914.2	2.83	4.93	19 29.8
30	12 2 43.21	5.103	1 34 39.8	32.04	0.249 2593	923.0	2.85	4.96	19 27.9
Dec. 1	12 4 45.50	+5.088	+1 21 52.0	−31.94	0.247 0336	− 931.8	2.86	4.98	19 26.0
2	12 6 47.45	5.074	1 9 6.6	31.84	0.244 7866	940.7	2.88	5.01	19 24.1
3	12 8 49.04	5.059	0 56 23.7	31.74	0.242 5182	949.6	2.89	5.03	19 22.2
4	12 10 50.28	5.044	0 43 43.3	31.63	0.240 2283	958.6	2.90	5.06	19 20.3
5	12 12 51.17	5.030	0 31 5.5	31.52	0.237 9168	967.6	2.92	5.09	19 18.4
6	12 14 51.71	+5.015	+0 18 30.4	−31.40	0.235 5835	− 976.8	2.94	5.12	19 16.4
7	12 16 51.89	5.000	+0 5 58.2	31.28	0.233 2282	986.0	2.95	5.14	19 14.5
8	12 18 51.72	4.985	−0 6 31.1	31.16	0.230 8508	995.3	2.97	5.17	19 12.5
9	12 20 51.19	4.970	0 18 57.4	31.03	0.228 4509	1004.7	2.98	5.20	19 10.6
10	12 22 50.30	4.955	0 31 20.6	30.90	0.226 0283	1014.2	3.00	5.23	19 8.6
11	12 24 49.04	+4.940	−0 43 40.6	−30.77	0.223 5828	−1023.8	3.02	5.26	19 6.7
12	12 26 47.42	4.924	0 55 57.3	30.62	0.221 1142	1033.4	3.04	5.29	19 4.7
13	12 28 45.41	4.908	1 8 10.5	30.48	0.218 6223	1043.2	3.05	5.32	19 2.7
14	12 30 43.02	4.892	1 20 20.2	30.33	0.216 1068	1053.1	3.07	5.35	19 0.7
15	12 32 40.23	4.875	1 32 26.3	30.18	0.213 5676	1063.0	3.09	5.38	18 58.7
16	12 34 37.04	+4.859	−1 44 28.7	−30.02	0.211 0045	−1072.9	3.11	5.41	18 56.7
17	12 36 33.45	4.842	1 56 27.2	29.85	0.208 4175	1082.9	3.13	5.45	18 54.7
18	12 38 29.43	4.824	2 8 21.7	29.69	0.205 8065	1092.9	3.15	5.48	18 52.7
19	12 40 24.99	4.806	2 20 12.1	29.51	0.203 1715	1102.9	3.16	5.51	18 50.7
20	12 42 20.11	4.788	2 31 58.3	29.34	0.200 5124	1113.0	3.19	5.55	18 48.7
21	12 44 14.79	+4.769	−2 43 40.2	−29.15	0.197 8290	−1123.1	3.20	5.58	18 46.6
22	12 46 9.02	4.750	2 55 17.7	28.97	0.195 1213	1133.3	3.23	5.62	18 44.6
23	12 48 2.79	4.731	3 6 50.8	28.78	0.192 3892	1143.5	3.24	5.65	18 42.5
24	12 49 56.09	4.711	3 18 19.3	28.59	0.189 6326	1153.7	3.27	5.69	18 40.4
25	12 51 48.91	4.691	3 29 43.1	28.39	0.186 8516	1163.9	3.28	5.72	18 38.4
26	12 53 41.25	+4.671	−3 41 2.2	−28.20	0.184 0460	−1174.1	3.31	5.76	18 36.3
27	12 55 33.10	4.650	3 52 16.5	27.99	0.181 2159	1184.3	3.33	5.80	18 34.2
28	12 57 24.44	4.629	4 3 25.9	27.79	0.178 3612	1194.6	3.35	5.84	18 32.2
29	12 59 15.27	4.607	4 14 30.3	27.58	0.175 4818	1204.9	3.37	5.87	18 30.1
30	13 1 5.59	4.586	4 25 29.6	27.37	0.172 5778	1215.2	3.39	5.91	18 28.0
31	13 2 55.38	+4.563	−4 36 23.8	−27.15	0.169 6490	−1225.5	3.42	5.95	18 25.8
32	13 4 44.63	. . .	−4 47 12.7	. . .	0.166 6954	. . . .	3.44	5.99	18 23.7

MARS, 1919.

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ′ ″	′ ″	″	° ′ ″	″		
Jan. 1	330 1 58.6	38 4.9	−20.3	−1 48 56.0	+14.2	0.140 4578	− 318
3	331 18 9.0	38 5.5	22.5	1 48 26.0	15.8	0.140 4032	228
5	332 34 20.4	38 5.8	24.7	1 47 52.8	17.4	0.140 3667	137
7	333 50 32.2	38 6.0	26.8	1 47 16.5	19.0	0.140 3484	− 46
9	335 6 44.2	38 6.0	28.8	1 46 36.9	20.6	0.140 3483	+ 45
11	336 22 55.9	38 5.7	−30.8	−1 45 54.3	+22.1	0.140 3664	+ 136
13	337 39 7.0	38 5.3	32.7	1 45 8.5	23.7	0.140 4027	227
15	338 55 17.0	38 4.7	34.5	1 44 19.7	25.2	0.140 4571	317
17	340 11 25.7	38 3.9	36.3	1 43 27.8	26.7	0.140 5296	408
19	341 27 32.6	38 2.9	38.1	1 42 32.8	28.3	0.140 6202	498
21	342 43 37.3	38 1.8	−39.7	−1 41 34.8	+29.7	0.140 7288	+ 588
23	343 59 39.5	38 0.4	41.3	1 40 34.0	31.2	0.140 8553	677
25	345 15 38.8	37 58.8	42.7	1 39 30.2	32.6	0.140 9996	766
27	346 31 34.7	37 57.1	44.1	1 38 23.6	34.0	0.141 1617	855
29	347 47 27.0	37 55.2	45.5	1 37 14.1	35.4	0.141 3414	942
31	349 3 15.2	37 53.1	−46.7	−1 36 1.9	+36.8	0.141 5386	+1029
Feb. 2	350 18 59.1	37 50.8	47.8	1 34 46.9	38.2	0.141 7531	1116
4	351 34 38.1	37 48.3	48.8	1 33 29.2	39.5	0.141 9848	1201
6	352 50 12.1	37 45.6	49.8	1 32 9.0	40.8	0.142 2336	1286
8	354 5 40.5	37 42.8	50.6	1 30 46.1	42.1	0.142 4993	1370
10	355 21 3.2	37 39.9	−51.4	−1 29 20.7	+43.3	0.142 7817	+1453
12	356 36 19.8	37 36.7	52.0	1 27 52.9	44.5	0.143 0806	1535
14	357 51 29.8	37 33.3	52.6	1 26 22.7	45.7	0.143 3958	1617
16	359 6 33.0	37 29.8	53.0	1 24 50.1	46.9	0.143 7272	1697
18	0 21 29.1	37 26.2	53.4	1 23 15.3	48.0	0.144 0744	1775
20	1 36 17.8	37 22.4	−53.6	−1 21 38.3	+49.1	0.144 4373	+1853
22	2 50 58.7	37 18.5	53.7	1 19 59.1	50.1	0.144 8155	1929
24	4 5 31.6	37 14.3	53.8	1 18 17.8	51.2	0.145 2090	2005
26	5 19 56.0	37 10.1	53.7	1 16 34.5	52.2	0.145 6174	2079
28	6 34 11.9	37 5.7	53.6	1 14 49.2	53.1	0.146 0404	2151
Mar. 2	7 48 18.8	37 1.2	−53.3	−1 13 2.1	+54.0	0.146 4778	+2223
4	9 2 16.6	36 56.5	52.9	1 11 13.2	54.9	0.146 9294	2293
6	10 16 4.8	36 51.7	52.5	1 9 22.5	55.8	0.147 3947	2361
8	11 29 43.4	36 46.8	51.9	1 7 30.2	56.6	0.147 8736	2428
10	12 43 12.0	36 41.8	51.3	1 5 36.2	57.4	0.148 3658	2493
12	13 56 30.4	36 36.6	−50.5	−1 3 40.8	+58.1	0.148 8708	+2557
14	15 9 38.3	36 31.3	49.7	1 1 43.9	58.8	0.149 3886	2620
16	16 22 35.6	36 25.9	48.8	0 59 45.6	59.5	0.149 9186	2681
18	17 35 22.0	36 20.4	47.8	0 57 45.9	60.2	0.150 4607	2740
20	18 47 57.3	36 14.9	46.7	0 55 45.0	60.7	0.151 0144	2797
22	20 0 21.4	36 9.2	−45.5	−0 53 43.0	+61.3	0.151 5795	+2853
24	21 12 33.9	36 3.4	44.3	0 51 39.8	61.9	0.152 1556	2908
26	22 24 34.8	35 57.5	43.0	0 49 35.6	62.4	0.152 7425	2961
28	23 36 23.8	35 51.5	41.6	0 47 30.4	62.8	0.153 3397	3011
30	24 48 0.8	35 45.5	40.1	0 45 24.4	63.2	0.153 9469	3061
Apr. 1	25 59 25.7	35 39.4	−38.6	−0 43 17.5	+63.6	0.154 5639	+3109
3	27 10 38.3	35 33.2	−37.0	−0 41 9.9	+64.0	0.155 1902	+3155

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ′ ″	′ ″	″	° ′ ″	″		
pr. 1	25 59 25.7	35 39.4	−38.6	−0 43 17.5	+63.6	0.154 5639	+3109
3	27 10 38.3	35 33.2	37.0	0 41 9.9	64.0	0.155 1902	3155
5	28 21 38.4	35 26.9	35.4	0 39 1.7	64.3	0.155 8256	3199
7	29 32 25.9	35 20.6	33.7	0 36 52.8	64.6	0.156 4696	3241
9	30 43 0.7	35 14.2	32.0	0 34 43.3	64 9	0.157 1220	3282
11	31 53 22.6	35 7.7	−30.2	−0 32 33.4	+65.1	0.157 7824	+3322
13	33 3 31.6	35 1.3	28.3	0 30 23.0	65.3	0.158 4505	3359
15	34 13 27.6	34 54.7	26.4	0 28 12.3	65.4	0.159 1259	3395
17	35 23 10.4	34 48.1	24.5	0 26 1.3	65.6	0.159 8083	3429
19	36 32 39.9	34 41.5	22.6	0 23 50.0	65.7	0.160 4974	3461
21	37 41 56.2	34 34.8	−20.6	−0 21 38.6	+65.7	0.161 1927	+3492
23	38 50 59.1	34 28.1	18.6	0 19 27.1	65.8	0.161 8940	3521
25	39 59 48.6	34 21.4	16.5	0 17 15.6	65.8	0.162 6010	3548
27	41 8 24.6	34 14.6	14.5	0 15 4.0	65.8	0.163 3132	3574
29	42 16 47.0	34 7.8	12.4	0 12 52.6	65.7	0.164 0304	3598
ay 1	43 24 55.8	34 1.0	−10.3	−0 10 41.3	+65.6	0.164 7522	+3620
3	44 32 51.0	33 54.2	.8.2	0 8 30.2	65.5	0.165 4784	3641
5	45 40 32.6	33 47.4	6.1	0 6 19.2	65.4	0.166 2086	3660
7	46 48 0.4	33 40.5	4.0	0 4 8.6	65.2	0.166 9424	3678
9	47 55 14.6	33 33.7	− 1.9	−0 1 58.4	65.0	0.167 6796	3694
11	49 2 15.1	33 26.8	+ 0.2	+0 0 11.5	+64.8	0.168 4198	+3708
13	50 9 1.9	33 20.0	2.3	0 2 20.9	64.6	0.169 1627	3721
15	51 15 35.0	33 13.1	4.4	0 4 29.8	64.3	0.169 9080	3732
17	52 21 54.4	33 6.3	6.4	0 6 38.2	64.1	0.170 6554	3742
19	53 28 0.1	32 59.5	8.5	0 8 46.0	63.8	0.171 4047	3750
21	54 33 52.2	32 52.6	+10.5	+0 10 53.2	+63.4	0.172 1554	+3757
23	55 39 30.6	32 45.8	12.5	0 12 59.6	63.1	0.172 9074	3763
25	56 44 55.4	32 39.0	14.5	0 15 5.4	62.7	0.173 6603	3766
27	57 50 6.7	32 32.2	16.4	0 17 10.4	62.3	0.174 4138	3769
29	58 55 4.4	32 25.5	18.4	0 19 14.6	61.9	0.175 1677	3770
31	59 59 48.7	32 18.8	+20.3	+0 21 17.9	+61.4	0.175 9217	+3770
une 2	61 4 19.5	32 12.0	22.2	0 23 20.4	61.0	0.176 6755	3768
4	62 8 36.9	32 5.4	23.9	0 25 22.0	60.6	0.177 4288	3765
6	63 12 41.0	31 58.7	25.7	0 27 22.6	60.1	0.178 1813	3760
8	64 16 31.9	31 52.1	27.4	0 29 22.2	59.6	0.178 9329	3755
10	65 20 9.6	31 45.5	+29.1	+0 31 20.8	+59.1	0.179 6832	+3748
12	66 23 34.1	31 39.0	30.8	0 33 18.4	58.5	0.180 4321	3740
14	67 26 45.7	31 32.5	32.4	0 35 14.9	57.9	0.181 1792	3731
16	68 29 44.3	31 26.1	33.9	0 37 10.2	57.4	0.181 9243	3720
18	69 32 30.0	31 19.6	35.4	0 39 4.5	56.9	0.182 6672	3708
20	70 35 2.9	31 13.3	+36.9	+0 40 57.6	+56.2	0.183 4076	+3695
22	71 37 23.1	31 6.9	38.3	0 42 49.4	55.6	0.184 1453	3681
24	72 39 30.7	31 0.7	39.6	0 44 40.1	55.0	0.184 8801	3666
26	73 41 25.8	30 54.5	40.9	0 46 29.4	54.4	0.185 6118	3650
28	74 43 8.5	30 48.3	42.1	0 48 17.6	53.8	0.186 3402	3633
30	75 44 38.9	30 42.1	+43.3	+0 50 4.4	+53.1	0.187 0649	+3615
uly 2	76 45 57.0	30 36.0	+44.4	+0 51 50.0	+52.5	0.187 7860	+3595

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	′ ″	″	° ′ ″	″		
July	2	76 45 57.0	30 36.0	+44.4	+0 51 50.0	+52.5	0.187 7860	+3595
	4	77 47 3.1	30 30.0	45.5	0 53 34.2	51.7	0.188 5030	3575
	6	78 47 57.2	30 24.1	46.5	0 55 17.0	51.1	0.189 2159	3554
	8	79 48 39.4	30 18.2	47.4	0 56 58.5	50.4	0.189 9244	3531
	10	80 49 9.9	30 12.3	48.2	0 58 38.6	49.7	0.190 6283	3508
	12	81 49 28.7	30 6.5	+49.0	+1 0 17.2	+49.0	0.191 3275	+3484
	14	82 49 36.0	30 0.8	49.8	1 1 54.5	48.3	0.192 0218	3459
	16	83 49 31.8	29 55.1	50.5	1 3 30.3	47.5	0.192 7110	3433
	18	84 49 16.4	29 49.5	51.1	1 5 4.6	46.8	0.193 3949	3406
	20	85 48 49.8	29 43.9	51.6	1 6 37.6	46.1	0.194 0734	3378
	22	86 48 12.1	29 38.4	+52.1	+1 8 9.0	+45.4	0.194 7462	+3350
	24	87 47 23.6	29 33.0	52.5	1 9 38.9	44.6	0.195 4133	3321
	26	88 46 24.3	29 27.7	52.9	1 11 7.3	43.8	0.196 0745	3291
	28	89 45 14.3	29 22.4	53.2	1 12 34.2	43.1	0.196 7296	3260
	30	90 43 53.8	29 17.2	53.4	1 13 59.6	42.3	0.197 3785	3229
Aug.	1	91 42 23.0	29 12.0	+53.6	+1 15 23.4	+41.5	0.198 0211	+3197
	3	92 40 41.9	29 6.9	53.7	1 16 45.6	40.8	0.198 6571	3163
	5	93 38 50.7	29 1.9	53.8	1 18 6.4	40.0	0.199 2864	3130
	7	94 36 49.5	28 56.9	53.8	1 19 25.5	39.2	0.199 9090	3096
	9	95 34 38.5	28 52.1	53.7	1 20 43.1	38.4	0.200 5247	3061
	11	96 32 17.8	28 47.2	+53.6	+1 21 59.1	+37.6	0.201 1333	+3025
	13	97 29 47.5	28 42.5	53.4	1 23 13.5	36.8	0.201 7347	2989
	15	98 27 7.8	28 37.8	53.1	1 24 26.3	36.0	0.202 3289	2952
	17	99 24 18.8	28 33.2	52.8	1 25 37.5	35.2	0.202 9156	2915
	19	100 21 20.7	28 28.7	52.5	1 26 47.2	34.4	0.203 4948	2877
	21	101 18 13.6	28 24.2	+52.0	+1 27 55.2	+33.6	0.204 0664	+2839
	23	102 14 57.6	28 19.8	51.5	1 29 1.5	32.7	0.204 6303	2800
	25	103 11 32.9	28 15.5	51.0	1 30 6.2	32.0	0.205 1863	2760
	27	104 7 59.7	28 11.3	50.4	1 31 9.4	31.2	0.205 7343	2720
	29	105 4 18.1	28 7.1	49.8	1 32 10.8	30.4	0.206 2744	2680
	31	106 0 28.2	28 3.0	+49.1	+1 33 10.7	+29.6	0.206 8062	+2639
Sept.	2	106 56 30.1	27 59.0	48.3	1 34 9.0	28.7	0.207 3298	2597
	4	107 52 24.1	27 55.0	47.5	1 35 5.6	27.9	0.207 8451	2556
	6	108 48 10.2	27 51.1	46.7	1 36 0.6	27.1	0.208 3520	2513
	8	109 43 48.7	27 47.3	45.8	1 36 54.0	26.3	0.208 8503	2470
	10	110 39 19.6	27 43.6	+44.9	+1 37 45.7	+25.5	0.209 3400	+2427
	12	111 34 43.1	27 39.9	43.9	1 38 35.8	24.6	0.209 8212	2384
	14	112 29 59.4	27 36.4	42.9	1 39 24.2	23.8	0.210 2935	2340
	16	113 25 8.6	27 32.9	41.8	1 40 11.0	23.0	0.210 7571	2296
	18	114 20 10.9	27 29.4	40.7	1 40 56.2	22.1	0.211 2117	2251
	20	115 15 6.4	27 26.1	+39.6	+1 41 39.6	+21.3	0.211 6574	+2206
	22	116 9 55.2	27 22.8	38.4	1 42 21.5	20.5	0.212 0941	2161
	24	117 4 37.6	27 19.6	37.2	1 43 1.8	19.7	0.212 5217	2115
	26	117 59 13.6	27 16.4	35.9	1 43 40.3	18.9	0.212 9401	2069
	28	118 53 43.4	27 13.4	34.6	1 44 17.3	18.1	0.213 3492	2023
	30	119 48 7.1	27 10.4	+33.3	+1 44 52.6	+17.2	0.213 7491	+1976
Oct.	2	120 42 24.9	27 7.5	+32.0	+1 45 26.2	+16.4	0.214 1396	+1929

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	′ ″	″	° ′ ″	″		
Oct.	2	120 42 24.9	27 7.5	+32.0	+1 45 26.2	+16.4	0.214 1396	+1929
	4	121 36 37.0	27 4.6	30.6	1 45 58.3	15.6	0.214 5208	1882
	6	122 30 43.5	27 1.9	29.2	1 46 28.7	14.8	0.214 8924	1834
	8	123 24 44.5	26 59.2	27.7	1 46 57.5	14.0	0.215 2546	1787
	10	124 18 40.2	26 56.6	26.3	1 47 24.6	13.1	0.215 6072	1739
	12	125 12 30.8	26 54.0	+24.8	+1 47 50.1	+12.4	0.215 9502	+1691
	14	126 6 16.4	26 51.6	23.3	1 48 14.1	11.6	0.216 2836	1643
	16	126 59 57.2	26 49.2	21.8	1 48 36.4	10.7	0.216 6072	1594
	18	127 53 33.2	26 46.9	20.2	1 48 57.0	9.9	0.216 9211	1545
	20	128 47 4.7	26 44.6	18.7	1 49 16.1	9.1	0.217 2252	1496
	22	129 40 31.8	26 42.5	+17.1	+1 49 33.5	+ 8.3	0.217 5196	+1447
	24	130 33 54.6	26 40.4	15.5	1 49 49.4	7.5	0.217 8040	1397
	26	131 27 13.3	26 38.3	13.9	1 50 3.6	6.7	0.218 0785	1348
	28	132 20 28.0	26 36.4	12.3	1 50 16.2	5.9	0.218 3431	1298
	30	133 13 39.0	26 34.6	10.7	1 50 27.2	5.1	0.218 5978	1248
Nov.	1	134 6 46.3	26 32.8	+ 9.0	+1 50 36.6	+ 4.3	0.218 8424	+1198
	3	134 59 50.1	26 31.0	7.4	1 50 44.5	3.6	0.219 0771	1148
	5	135 52 50.5	26 29.4	5.7	1 50 50.8	2.8	0.219 3017	1098
	7	136 45 47.7	26 27.8	4.1	1 50 55.5	1.9	0.219 5162	1047
	9	137 38 41.9	26 26.4	2.4	1 50 58.6	1.1	0.219 7206	996
	11	138 31 33.2	26 24.9	+ 0.8	+1 51 0.1	+ 0.4	0.219 9148	+ 946
	13	139 24 21.7	26 23.6	− 0.9	1 51 0.1	− 0.4	0.220 0989	895
	15	140 17 7.6	26 22.3	2.5	1 50 58.4	1.2	0.220 2728	844
	17	141 9 51.0	26 21.1	4.2	1 50 55.3	2.0	0.220 4365	798
	19	142 2 32.1	26 20.0	5.8	1 50 50.5	2.8	0.220 5900	742
	21	142 55 11.0	26 19.0	− 7.4	+1 50 44.2	− 3.6	0.220 7332	+ 690
	23	143 47 48.0	26 18.0	9.1	1 50 36.3	4.3	0.220 8662	639
	25	144 40 23.0	26 17.1	10.7	1 50 26.9	5.1	0.220 9889	588
	27	145 32 56.4	26 16.3	12.3	1 50 16.0	5.9	0.221 1013	537
	29	146 25 28.1	26 15.5	13.9	1 50 3.5	6.6	0.221 2035	485
Dec.	1	147 17 58.4	26 14.8	−15.5	+1 49 49.6	− 7.4	0.221 2952	+ 433
	3	148 10 27.5	26 14.2	17.0	1 49 34.0	8.2	0.221 3767	382
	5	149 2 55.4	26 13.7	18.6	1 49 17.0	8.9	0.221 4479	330
	7	149 55 22.4	26 13.3	20.1	1 48 58.4	9.7	0.221 5087	278
	9	150 47 48.5	26 12.9	21.6	1 48 38.2	10.4	0.221 5591	226
	11	151 40 14.0	26 12.6	−23.1	+1 48 16.7	−11.1	0.221 5992	+ 175
	13	152 32 38.9	26 12.4	24.6	1 47 53.6	12.0	0.221 6290	123
	15	153 25 3.5	26 12.2	26.0	1 47 28.9	12.7	0.221 6484	71
	17	154 17 27.8	26 12.1	27.5	1 47 2.8	13.4	0.221 6574	+ 19
	19	155 9 52.0	26 12.1	28.9	1 46 35.2	14.2	0.221 6560	− 33
	21	156 2 16.3	26 12.2	−30.2	+1 46 6.1	−14.9	0.221 6442	− 85
	23	156 54 40.8	26 12.3	31.6	1 45 35.5	15.6	0.221 6221	136
	25	157 47 5.7	26 12.6	32.9	1 45 3.5	16.4	0.221 5897	188
	27	158 39 31.1	26 12.9	34.2	1 44 30.0	17.1	0.221 5468	240
	29	159 31 57.2	26 13.2	35.4	1 43 55.0	17.9	0.221 4936	292
	31	160 24 24.1	26 13.7	−36.6	+1 43 18.5	−18.6	0.221 4300	− 344
	33	161 16 51.9	26 14.2	−37.8	+1 42 40.6	−19.3	0.221 3561	− 395

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
		h m s	s	° ′ ″	″			″	″	h m
Jan.	1	6 47 17.82	−1.466	+23 2 6.1	+2.01	0.622 8830	+ 5.9	22.43	2.10	12 4.7
	2	6 46 42.64	1.466	23 2 54.1	1.99	0.622 9137	19.7	22.43	2.10	12 0.1
	3	6 46 7.46	1.465	23 3 41.6	1.97	0.622 9775	33.5	22.42	2.10	11 55.6
	4	6 45 32.32	1.463	23 4 28.5	1.94	0.623 0746	47.3	22.42	2.10	11 51.1
	5	6 44 57.24	1.460	23 5 14.8	1.91	0.623 2047	61.1	22.41	2.10	11 46.6
	6	6 44 22.25	−1.455	+23 6 0.4	+1.89	0.623 3678	+ 74.8	22.40	2.09	11 42.1
	7	6 43 47.39	1.450	23 6 45.5	1.87	0.623 5636	88.4	22.39	2.09	11 37.6
	8	6 43 12.67	1.443	23 7 30.0	1.84	0.623 7920	101.9	22.38	2.09	11 33.1
	9	6 42 38.12	1.436	23 8 13.8	1.81	0.624 0528	115.4	22.37	2.09	11 28.6
	10	6 42 3.77	1.427	23 8 56.9	1.78	0.624 3458	128.7	22.35	2.09	11 24.1
	11	6 41 29.65	−1.417	+23 9 39.2	+1.75	0.624 6707	+142.0	22.34	2.09	11 19.6
	12	6 40 55.78	1.406	23 10 20.8	1.72	0.625 0274	155.2	22.32	2.09	11 15.1
	13	6 40 22.19	1.393	23 11 1.7	1.69	0.625 4156	168.3	22.30	2.08	11 10.6
	14	6 39 48.90	1.381	23 11 41.9	1.66	0.625 8350	181.2	22.28	2.08	11 6.1
	15	6 39 15.93	1.367	23 12 21.2	1.62	0.626 2853	194.0	22.25	2.08	11 1.7
	16	6 38 43.31	−1.352	+23 12 59.7	+1.59	0.626 7662	+206.7	22.23	2.08	10 57.2
	17	6 38 11.06	1.336	23 13 37.5	1.56	0.627 2773	219.2	22.20	2.08	10 52.7
	18	6 37 39.20	1.319	23 14 14.4	1.52	0.627 8184	231.6	22.17	2.07	10 48.3
	19	6 37 7.75	1.301	23 14 50.6	1.49	0.628 3891	243.9	22.15	2.07	10 43.8
	20	6 36 36.74	1.283	23 15 25.9	1.45	0.628 9891	256.0	22.12	2.07	10 39.4
	21	6 36 6.19	−1.263	+23 16 0.4	+1.42	0.629 6180	+268.0	22.08	2.06	10 34.9
	22	6 35 36.12	1.243	23 16 34.1	1.39	0.630 2754	279.8	22.05	2.06	10 30.5
	23	6 35 6.55	1.221	23 17 7.0	1.35	0.630 9610	291.5	22.01	2.06	10 26.1
	24	6 34 37.50	1.199	23 17 39.1	1.32	0.631 6743	302.9	21.98	2.05	10 21.7
	25	6 34 9.00	1.176	23 18 10.3	1.28	0.632 4149	314.2	21.94	2.05	10 17.3
	26	6 33 41.06	−1.152	+23 18 40.7	+1.25	0.633 1824	+325.3	21.90	2.05	10 12.9
	27	6 33 13.70	1.128	23 19 10.3	1.22	0.633 9763	336.2	21.86	2.04	10 8.5
	28	6 32 46.94	1.102	23 19 39.1	1.18	0.634 7961	346.9	21.82	2.04	10 4.1
	29	6 32 20.81	1.076	23 20 7.1	1.15	0.635 6412	357.4	21.78	2.04	9 59.8
	30	6 31 55.32	1.048	23 20 34.3	1.11	0.636 5113	367.7	21.74	2.03	9 55.4
	31	6 31 30.49	−1.021	+23 21 0.6	+1.08	0.637 4058	+377.7	21.69	2.03	9 51.1
Feb.	1	6 31 6.33	0.992	23 21 26.1	1.05	0.638 3241	387.5	21.64	2.02	9 46.8
	2	6 30 42.86	0.963	23 21 50.8	1.02	0.639 2657	397.1	21.60	2.02	9 42.5
	3	6 30 20.10	0.933	23 22 14.8	0.98	0.640 2299	406.4	21.55	2.02	9 38.2
	4	6 29 58.07	0.903	23 22 37.9	0.95	0.641 2161	415.4	21.50	2.01	9 33.9
	5	6 29 36.77	−0.872	+23 23 0.3	+0.92	0.642 2237	+424.2	21.45	2.01	9 29.6
	6	6 29 16.22	0.840	23 23 21.9	0.89	0.643 2522	432.8	21.40	2.00	9 25.3
	7	6 28 56.43	0.809	23 23 42.8	0.85	0.644 3008	441.0	21.35	2.00	9 21.1
	8	6 28 37.40	0.777	23 24 2.9	0.82	0.645 3690	449.1	21.30	1.99	9 16.8
	9	6 28 19.16	0.744	23 24 22.3	0.79	0.646 4561	456.8	21.24	1.99	9 12.6
	10	6 28 1.70	−0.711	+23 24 41.0	+0.76	0.647 5616	+464.4	21.19	1.98	9 8.4
	11	6 27 45.04	0.677	23 24 58.9	0.73	0.648 6848	471.6	21.13	1.98	9 4.2
	12	6 27 29.19	0.644	23 25 16.2	0.71	0.649 8251	478.6	21.08	1.97	9 0.0
	13	6 27 14.14	0.610	23 25 32.8	0.68	0.650 9821	485.5	21.02	1.97	8 55.8
	14	6 26 59.91	0.576	23 25 48.7	0.65	0.652 1551	492.0	20.97	1.96	8 51.6
	15	6 26 46.51	−0.541	+23 26 4.0	+0.62	0.653 3435	+498.3	20.91	1.96	8 47.5
	16	6 26 33.94	−0.506	+23 26 18.6	+0.60	0.654 5467	+504.4	20.85	1.95	8 43.4

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Feb. 16	6 26 33.94	−0.506	+23 26 18.6	+0.60	0.654 5467	+504.4	20.85	1.95	8 43.4
17	6 26 22.20	0.472	23 26 32.6	0.57	0.655 7643	510.2	20.79	1.94	8 39.2
18	6 26 11.30	0.437	23 26 45.9	0.54	0.656 9956	515.8	20.73	1.94	8 35.1
19	6 26 1.24	0.401	23 26 58.7	0.52	0.658 2400	521.2	20.67	1.93	8 31.0
20	6 25 52.04	0.366	23 27 10.8	0.49	0.659 4970	526.3	20.61	1.93	8 26.9
21	6 25 43.68	−0.330	+23 27 22.3	+0.47	0.660 7661	+531.2	20.55	1.92	8 22.9
22	6 25 36.18	0.295	23 27 33.3	0.44	0.662 0467	535.9	20.49	1.92	8 18.9
23	6 25 29.54	0.259	23 27 43.6	0.42	0.663 3383	540.3	20.43	1.91	8 14.8
24	6 25 23.76	0.223	23 27 53.3	0.39	0.664 6402	544.6	20.37	1.90	8 10.8
25	6 25 18.84	0.187	23 28 2.4	0.37	0.665 9521	548.6	20.31	1.90	8 6.8
26	6 25 14.79	−0.151	+23 28 11.0	+0.34	0.667 2733	+552.4	20.25	1.89	8 2.8
27	6 25 11.61	0.114	23 28 18.9	0.32	0.668 6033	555.9	20.19	1.89	7 58.8
28	6 25 9.30	0.078	23 28 26.2	0.29	0.669 9414	559.2	20.12	1.88	7 54.8
Mar. 1	6 25 7.86	0.042	23 28 33.0	0.27	0.671 2872	562.2	20.06	1.88	7 50.9
2	6 25 7.28	−0.006	23 28 39.2	0.25	0.672 6400	565.1	20.00	1.87	7 46.9
3	6 25 7.57	+0.030	+23 28 44.8	+0.22	0.673 9994	+567.7	19.94	1.86	7 43.0
4	6 25 8.73	0.066	23 28 49.8	0.20	0.675 3648	570.1	19.88	1.86	7 39.1
5	6 25 10.76	0.103	23 28 54.3	0.18	0.676 7357	572.2	19.81	1.85	7 35.2
6	6 25 13.65	0.138	23 28 58.2	0.15	0.678 1114	574.2	19.75	1.85	7 31.3
7	6 25 17.39	0.174	23 29 1.5	0.12	0.679 4915	575.9	19.69	1.84	7 27.5
8	6 25 22.00	+0.210	+23 29 4.2	+0.10	0.680 8754	+577.3	19.62	1.83	7 23.6
9	6 25 27.46	0.245	23 29 6.4	0.08	0.682 2626	578.6	19.56	1.83	7 19.8
10	6 25 33.76	0.280	23 29 8.0	0.05	0.683 6527	579.7	19.50	1.82	7 16.0
11	6 25 40.90	0.315	23 29 9.0	+0.03	0.685 0451	580.6	19.44	1.82	7 12.2
12	6 25 48.88	0.350	23 29 9.4	0.00	0.686 4395	581.4	19.38	1.81	7 8.4
13	6 25 57.69	+0.384	+23 29 9.2	−0.02	0.687 8355	+581.9	19.31	1.81	7 4.6
14	6 26 7.33	0.419	23 29 8.5	0.04	0.689 2325	582.3	19.25	1.80	7 0.8
15	6 26 17.78	0.452	23 29 7.2	0.07	0.690 6303	582.5	19.19	1.79	6 57.0
16	6 26 29.04	0.486	23 29 5.3	0.09	0.692 0283	582.5	19.13	1.79	6 53.3
17	6 26 41.11	0.520	23 29 2.8	0.12	0.693 4263	582.4	19.07	1.78	6 49.6
18	6 26 53.98	+0.553	+23 28 59.7	−0.14	0.694 8238	+582.2	19.00	1.78	6 45.9
19	6 27 7.65	0.586	23 28 56.0	0.17	0.696 2205	581.7	18.94	1.77	6 42.2
20	6 27 22.10	0.619	23 28 51.6	0.20	0.697 6159	581.1	18.88	1.77	6 38.5
21	6 27 37.34	0.651	23 28 46.6	0.22	0.699 0098	580.4	18.82	1.76	6 34.8
22	6 27 53.35	0.683	23 28 41.0	0.25	0.700 4018	579.6	18.76	1.75	6 31.2
23	6 28 10.13	+0.715	+23 28 34.7	−0.28	0.701 7916	+578.5	18.70	1.75	6 27.5
24	6 28 27.68	0.747	23 28 27.7	0.30	0.703 1787	577.4	18.64	1.74	6 23.9
25	6 28 45.99	0.779	23 28 20.1	0.33	0.704 5630	576.1	18.58	1.74	6 20.2
26	6 29 5.05	0.810	23 28 11.8	0.36	0.705 9440	574.7	18.52	1.73	6 16.6
27	6 29 24.86	0.841	23 28 2.7	0.39	0.707 3214	573.1	18.47	1.73	6 13.0
28	6 29 45.40	+0.871	+23 27 53.0	−0.42	0.708 6949	+571.4	18.41	1.72	6 9.4
29	6 30 6.68	0.902	23 27 42.5	0.45	0.710 0642	569.6	18.35	1.72	6 5.8
30	6 30 28.69	0.932	23 27 31.3	0.48	0.711 4288	567.6	18.29	1.71	6 2.3
31	6 30 51.41	0.962	23 27 19.3	0.52	0.712 7885	565.5	18.23	1.70	5 58.7
Apr. 1	6 31 14.85	0.992	23 27 6.5	0.55	0.714 1430	563.2	18.18	1.70	5 55.2
2	6 31 39.00	+1.021	+23 26 53.0	−0.58	0.715 4919	+560.9	18.12	1.69	5 51.7
3	6 32 3.84	+1.049	+23 26 38.7	−0.61	0.716 8349	+558.3	18.07	1.69	5 48.2

JUPITER, 1919.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
Apr. 1	6 31 14.85	+0.992	+23 27 6.5	−0.55	0.714 1430	+563.2	18.18	1.70	5 55.2
2	6 31 39.00	1.021	23 26 53.0	0.58	0.715 4919	560.9	18.12	1.69	5 51.7
3	6 32 3.84	1.049	23 26 38.7	0.61	0.716 8349	558.3	18.07	1.69	5 48.2
4	6 32 29.37	1.078	23 26 23.5	0.65	0.718 1717	555.7	18.01	1.68	5 44.6
5	6 32 55.57	1.106	23 26 7.6	0.68	0.719 5020	552.9	17.95	1.68	5 41.1
6	6 33 22.45	+1.134	+23 25 50.8	−0.72	0.720 8255	+550.0	17.90	1.67	5 37.7
7	6 33 49.98	1.161	23 25 33.2	0.75	0.722 1421	547.1	17.85	1.67	5 34.2
8	6 34 18.17	1.188	23 25 14.7	0.79	0.723 4514	544.0	17.80	1.66	5 30.7
9	6 34 46.99	1.214	23 24 55.4	0.82	0.724 7533	540.9	17.74	1.66	5 27.3
10	6 35 16.45	1.240	23 24 35.2	0.86	0.726 0476	537.7	17.69	1.65	5 23.8
11	6 35 46.53	+1.266	+23 24 14.0	−0.90	0.727 3340	+534.3	17.63	1.65	5 20.4
12	6 36 17.23	1.292	23 23 52.0	0.94	0.728 6124	531.0	17.58	1.64	5 17.0
13	6 36 48.53	1.317	23 23 29.0	0.98	0.729 8825	527.5	17.53	1.64	5 13.6
14	6 37 20.43	1.342	23 23 5.1	1.01	0.731 1442	523.9	17.48	1.63	5 10.2
15	6 37 52.92	1.366	23 22 40.3	1.05	0.732 3972	520.3	17.43	1.63	5 6.8
16	6 38 25.99	+1.390	+23 22 14.5	−1.10	0.733 6415	+516.6	17.38	1.62	5 3.4
17	6 38 59.64	1.414	23 21 47.7	1.14	0.734 8769	512.9	17.33	1.62	5 0.0
18	6 39 33.85	1.437	23 21 19.9	1.18	0.736 1032	509.1	17.28	1.61	4 56.7
19	6 40 8.63	1.461	23 20 51.1	1.22	0.737 3203	505.2	17.23	1.61	4 53.3
20	6 40 43.95	1.483	23 20 21.3	1.26	0.738 5280	501.2	17.19	1.61	4 50.0
21	6 41 19.81	+1.505	+23 19 50.5	−1.31	0.739 7262	+497.2	17.14	1.60	4 46.6
22	6 41 56.21	1.528	23 19 18.6	1.35	0.740 9147	493.2	17.09	1.60	4 43.3
23	6 42 33.14	1.550	23 18 45.6	1.40	0.742 0933	489.0	17.04	1.59	4 40.0
24	6 43 10.59	1.571	23 18 11.4	1.45	0.743 2619	484.8	17.00	1.59	4 36.7
25	6 43 48.55	1.592	23 17 36.2	1.49	0.744 4203	480.5	16.95	1.58	4 33.4
26	6 44 27.02	+1.614	+23 16 59.8	−1.54	0.745 5684	+476.2	16.91	1.58	4 30.1
27	6 45 6.00	1.634	23 16 22.3	1.58	0.746 7060	471.8	16.86	1.58	4 26.8
28	6 45 45.46	1.654	23 15 43.7	1.63	0.747 8329	467.3	16.82	1.57	4 23.5
29	6 46 25.41	1.674	23 15 3.9	1.68	0.748 9490	462.8	16.78	1.57	4 20.3
30	6 47 5.83	1.694	23 14 22.9	1.73	0.750 0542	458.2	16.73	1.56	4 17.0
May 1	6 47 46.72	+1.713	+23 13 40.7	−1.78	0.751 1483	+453.5	16.69	1.56	4 13.8
2	6 48 28.06	1.732	23 12 57.3	1.83	0.752 2311	448.8	16.65	1.56	4 10.5
3	6 49 9.86	1.751	23 12 12.7	1.88	0.753 3025	444.0	16.61	1.55	4 7.3
4	6 49 52.10	1.769	23 11 26.9	1.93	0.754 3623	439.2	16.57	1.55	4 4.0
5	6 50 34.78	1.787	23 10 39.9	1.98	0.755 4105	434.3	16.53	1.55	4 0.8
6	6 51 17.88	+1.804	+23 9 51.7	−2.04	0.756 4470	+429.4	16.49	1.54	3 57.6
7	6 52 1.39	1.821	23 9 2.2	2.09	0.757 4716	424.5	16.45	1.54	3 54.4
8	6 52 45.31	1.838	23 8 11.5	2.14	0.758 4844	419.5	16.41	1.53	3 51.2
9	6 53 29.63	1.855	23 7 19.4	2.20	0.759 4853	414.5	16.38	1.53	3 48.0
10	6 54 14.34	1.871	23 6 26.1	2.25	0.760 4741	409.5	16.34	1.53	3 44.8
11	6 54 59.43	+1.887	+23 5 31.5	−2.30	0.761 4509	+404.5	16.30	1.52	3 41.6
12	6 55 44.89	1.902	23 4 35.6	2.36	0.762 4156	399.4	16.27	1.52	3 38.4
13	6 56 30.73	1.917	23 3 38.4	2.41	0.763 3682	394.4	16.23	1.52	3 35.3
14	6 57 16.92	1.933	23 2 39.9	2.47	0.764 3086	389.3	16.19	1.51	3 32.1
15	6 58 3.47	1.947	23 1 40.0	2.52	0.765 2366	384.1	16.16	1.51	3 28.9
16	6 58 50.37	+1.961	+23 0 38.8	−2.58	0.766 1523	+378.9	16.13	1.51	3 25.8
17	6 59 37.61	+1.975	+22 59 36.2	−2.64	0.767 0555	+373.8	16.09	1.50	3 22.6

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
		h m s	s	° ′ ″	″			″	″	h m
May	17	6 59 37.61	+1.975	+22 59 36.2	−2.64	0.767 0555	+373.8	16.09	1.50	3 22.6
	18	7 0 25.19	1.989	22 58 32.2	2.69	0.767 9464	368.6	16.06	1.50	3 19.5
	19	7 1 13.09	2.002	22 57 26.9	2.75	0.768 8247	363.4	16.03	1.50	3 16.4
	20	7 2 1.31	2.016	22 56 20.2	2.81	0.769 6905	358.1	15.99	1.50	3 13.2
	21	7 2 49.85	2.029	22 55 12.1	2.87	0.770 5437	352.8	15.96	1.49	3 10.1
	22	7 3 38.70	+2.042	+22 54 2.6	−2.92	0.771 3841	+347.5	15.93	1.49	3 7.0
	23	7 4 27.85	2.054	22 52 51.7	2.98	0.772 2118	342.2	15.90	1.49	3 3.9
	24	7 5 17.30	2.066	22 51 39.4	3.04	0.773 0267	336.8	15.87	1.48	3 0.8
	25	7 6 7.04	2.079	22 50 25.6	3.10	0.773 8286	331.4	15.84	1.48	2 57.7
	26	7 6 57.07	2.090	22 49 10.5	3.16	0.774 6176	326.0	15.81	1.48	2 54.6
	27	7 7 47.38	+2.102	+22 47 53.9	−3.22	0.775 3934	+320.5	15.79	1.48	2 51.5
	28	7 8 37.96	2.113	22 46 35.9	3.28	0.776 1562	315.1	15.76	1.47	2 48.4
	29	7 9 28.81	2.124	22 45 16.4	3.34	0.776 9057	309.5	15.73	1.47	2 45.3
	30	7 10 19.91	2.134	22 43 55.5	3.40	0.777 6420	304.0	15.70	1.47	2 42.2
	31	7 11 11.25	2.144	22 42 33.1	3.46	0.778 3649	298.4	15.68	1.47	2 39.1
June	1	7 12 2.84	+2.155	+22 41 9.3	−3.52	0.779 0745	+292.9	15.65	1.46	2 36.0
	2	7 12 54.67	2.164	22 39 44.0	3.58	0.779 7706	287.3	15.63	1.46	2 33.0
	3	7 13 46.72	2.173	22 38 17.3	3.64	0.780 4534	281.7	15.60	1.46	2 29.9
	4	7 14 38.99	2.183	22 36 49.2	3.70	0.781 1226	276.0	15.58	1.46	2 26.8
	5	7 15 31.48	2.191	22 35 19.6	3.76	0.781 7784	270.5	15.56	1.45	2 23.8
	6	7 16 24.17	+2.200	+22 33 48.6	−3.82	0.782 4208	+264.8	15.53	1.45	2 20.7
	7	7 17 17.06	2.208	22 32 16.1	3.88	0.783 0496	259.2	15.51	1.45	2 17.7
	8	7 18 10.15	2.216	22 30 42.2	3.94	0.783 6649	253.6	15.49	1.45	2 14.6
	9	7 19 3.43	2.224	22 29 6.8	4.00	0.784 2667	247.9	15.47	1.45	2 11.6
	10	7 19 56.88	2.231	22 27 30.0	4.06	0.784 8549	242.3	15.45	1.44	2 8.5
	11	7 20 50.52	+2.238	+22 25 51.8	−4.12	0.785 4296	+236.6	15.43	1.44	2 5.5
	12	7 21 44.32	2.245	22 24 12.1	4.19	0.785 9908	231.0	15.41	1.44	2 2.4
	13	7 22 38.29	2.252	22 22 30.9	4.25	0.786 5386	225.4	15.39	1.44	1 59.4
	14	7 23 32.42	2.259	22 20 48.3	4.30	0.787 0728	219.8	15.37	1.44	1 56.4
	15	7 24 26.71	2.265	22 19 4.3	4.36	0.787 5935	214.1	15.35	1.44	1 53.3
	16	7 25 21.14	+2.271	+22 17 18.8	−4.43	0.788 1005	+208.4	15.33	1.43	1 50.3
	17	7 26 15.72	2.277	22 15 31.8	4.49	0.788 5940	202.8	15.31	1.43	1 47.3
	18	7 27 10.44	2.283	22 13 43.4	4.55	0.789 0738	197.1	15.30	1.43	1 44.3
	19	7 28 5.30	2.288	22 11 53.6	4.61	0.789 5399	191.3	15.28	1.43	1 41.2
	20	7 29 0.28	2.294	22 10 2.3	4.67	0.789 9923	185.7	15.26	1.43	1 38.2
	21	7 29 55.40	+2.299	+22 8 9.5	−4.73	0.790 4311	+180.0	15.25	1.43	1 35.2
	22	7 30 50.63	2.304	22 6 15.3	4.79	0.790 8561	174.2	15.23	1.42	1 32.2
	23	7 31 45.98	2.308	22 4 19.7	4.85	0.791 2673	168.5	15.22	1.42	1 29.2
	24	7 32 41.43	2.313	22 2 22.7	4.90	0.791 6647	162.7	15.21	1.42	1 26.2
	25	7 33 36.99	2.317	22 0 24.3	4.96	0.792 0482	156.9	15.19	1.42	1 23.1
	26	7 34 32.65	+2.321	+21 58 24.5	−5.02	0.792 4179	+151.1	15.18	1.42	1 20.1
	27	7 35 28.40	2.325	21 56 23.2	5.08	0.792 7736	145.3	15.17	1.42	1 17.1
	28	7 36 24.23	2.328	21 54 20.6	5.14	0.793 1153	139.4	15.16	1.42	1 14.1
	29	7 37 20.14	2.331	21 52 16.6	5.20	0.793 4429	133.6	15.14	1.42	1 11.1
	30	7 38 16.13	2.334	21 50 11.2	5.25	0.793 7565	127.8	15.13	1.41	1 8.1
July	1	7 39 12.18	+2.337	+21 48 4.5	−5.31	0.794 0562	+121.9	15.12	1.41	1 5.1
	2	7 40 8.29	+2.339	+21 45 56.4	−5.36	0.794 3418	+116.1	15.11	1.41	1 2.1

JUPITER, 1919.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
July 1	7 39 12.18	+2.337	+21 48 4.5	−5.31	0.794 0562	+121.9	15.12	1.41	1 5.1
2	7 40 8.29	2.339	21 45 56.4	5.36	0.794 3418	116.1	15.11	1.41	1 2.1
3	7 41 4.46	2.341	21 43 47.0	5.42	0.794 6135	110.3	15.10	1.41	0 59.1
4	7 42 0.67	2.343	21 41 36.3	5.48	0.794 8712	104.5	15.09	1.41	0 56.1
5	7 42 56.93	2.345	21 39 24.2	5.53	0.795 1150	98.6	15.09	1.41	0 53.1
6	7 43 53.23	+2.346	+21 37 10.9	−5.58	0.795 3447	+ 92.8	15.08	1.41	0 50.1
7	7 44 49.56	2.348	21 34 56.3	5.64	0.795 5605	87.0	15.07	1.41	0 47.1
8	7 45 45.92	2.349	21 32 40.4	5.69	0.795 7623	81.2	15.06	1.41	0 44.1
9	7 46 42.31	2.350	21 30 23.2	5.74	0.795 9502	75.4	15.06	1.41	0 41.1
10	7 47 38.71	2.350	21 28 4.8	5.79	0.796 1241	69.6	15.05	1.41	0 38.1
11	7 48 35.13	+2.351	+21 25 45.1	−5.85	0.796 2842	+ 63.8	15.05	1.41	0 35.1
12	7 49 31.56	2.351	21 23 24.2	5.90	0.796 4303	58.0	15.04	1.41	0 32.1
13	7 50 27.99	2.351	21 21 2.0	5.95	0.796 5626	52.2	15.04	1.41	0 29.1
14	7 51 24.42	2.351	21 18 38.7	6.00	0.796 6810	46.4	15.03	1.41	0 26.1
15	7 52 20.85	2.351	21 16 14.1	6.05	0.796 7855	40.6	15.03	1.41	0 23.1
16	7 53 17.28	+2.351	+21 13 48.3	−6.10	0.796 8761	+ 34.9	15.02	1.40	0 20.2
17	7 54 13.69	2.350	21 11 21.4	6.15	0.796 9528	29.0	15.02	1.40	0 17.2
18	7 55 10.09	2.350	21 8 53.3	6.19	0.797 0155	23.2	15.02	1.40	0 14.2
19	7 56 6.47	2.349	21 6 24.1	6.24	0.797 0643	17.4	15.02	1.40	0 11.2
20	7 57 2.82	2.347	21 3 53.7	6.29	0.797 0991	11.6	15.02	1.40	0 8.2
21	7 57 59.14	+2.346	+21 1 22.2	−6.34	0.797 1198	+ 5.7	15.02	1.40	0 5.2
22	7 58 55.43	2.345	20 58 49.6	6.38	0.797 1264	− 0.3	15.02	1.40	0 2.2 23 59.2
23	7 59 51.68	2.343	20 56 15.9	6.43	0.797 1190	6.0	15.02	1.40	23 56.1
24	8 0 47.89	2.341	20 53 41.2	6.47	0.797 0974	11.9	15.02	1.40	23 53.1
25	8 1 44.05	2.339	20 51 5.5	6.51	0.797 0617	17.8	15.02	1.40	23 50.1
26	8 2 40.15	+2.336	+20 48 28.7	−6.55	0.797 0119	− 23.7	15.02	1.40	23 47.1
27	8 3 36.19	2.334	20 45 50.9	6.60	0.796 9480	29.6	15.02	1.40	23 44.1
28	8 4 32.16	2.331	20 43 12.1	6.63	0.796 8699	35.5	15.02	1.40	23 41.1
29	8 5 28.06	2.328	20 40 32.5	6.67	0.796 7777	41.3	15.03	1.41	23 38.1
30	8 6 23.88	2.324	20 37 51.9	6.71	0.796 6714	47.3	15.03	1.41	23 35.1
31	8 7 19.62	+2.320	+20 35 10.4	−6.75	0.796 5509	− 53.1	15.04	1.41	23 32.1
Aug. 1	8 8 15.26	2.317	20 32 28.0	6.78	0.796 4164	59.0	15.04	1.41	23 29.1
2	8 9 10.82	2.313	20 29 44.8	6.82	0.796 2678	64.8	15.05	1.41	23 26.1
3	8 10 6.27	2.308	20 27 0.7	6.85	0.796 1052	70.7	15.05	1.41	23 23.1
4	8 11 1.62	2.304	20 24 15.8	6.88	0.795 9285	76.5	15.06	1.41	23 20.1
5	8 11 56.86	+2.299	+20 21 30.2	−6.92	0.795 7379	− 82.3	15.06	1.41	23 17.1
6	8 12 51.99	2.295	20 18 43.7	6.95	0.795 5334	88.1	15.07	1.41	23 14.0
7	8 13 47.00	2.290	20 15 56.5	6.98	0.795 3149	93.9	15.08	1.41	23 11.0
8	8 14 41.89	2.284	20 13 8.6	7.01	0.795 0825	99.7	15.09	1.41	23 8.0
9	8 15 36.65	2.279	20 10 20.0	7.04	0.794 8362	105.5	15.10	1.41	23 4.9
10	8 16 31.29	+2.274	+20 7 30.7	−7.07	0.794 5760	−111.3	15.10	1.41	23 1.9
11	8 17 25.78	2.268	20 4 40.7	7.10	0.794 3020	117.1	15.11	1.41	22 58.9
12	8 18 20.14	2.262	20 1 50.1	7.12	0.794 0141	122.9	15.12	1.41	22 55.9
13	8 19 14.36	2.256	19 58 58.9	7.15	0.793 7122	128.7	15.13	1.42	22 52.8
14	8 20 8.43	2.250	19 56 7.1	7.17	0.793 3965	134.4	15.15	1.42	22 49.8
15	8 21 2.35	+2.243	+19 53 14.7	−7.19	0.793 0670	−140.2	15.16	1.42	22 46.8
16	8 21 56.11	+2.237	+19 50 21.8	−7.21	0.792 7236	−146.0	15.17	1.42	22 43.7

GREENWICH MEAN TIME.

ate.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
. 16	8 21 56.11	+2.237	+19 50 21.8	−7.21	0.792 7236	−146.0	15.17	1.42	22 43.7
17	8 22 49.72	2.230	19 47 28.4	7.24	0.792 3664	151.7	15.18	1.42	22 40.7
18	8 23 43.16	2.223	19 44 34.5	7.25	0.791 9952	157.6	15.19	1.42	22 37.6
19	8 24 36.42	2.216	19 41 40.2	7.27	0.791 6101	163.4	15.21	1.42	22 34.6
20	8 25 29.52	2.209	19 38 45.4	7.29	0.791 2110	169.2	15.22	1.42	22 31.5
21	8 26 22.44	+2.201	+19 35 50.3	−7.31	0.790 7979	−175.0	15.24	1.42	22 28.5
22	8 27 15.17	2.193	19 32 54.8	7.32	0.790 3709	180.8	15.25	1.43	22 25.4
23	8 28 7.70	2.185	19 29 59.0	7.33	0.789 9299	186.6	15.27	1.43	22 22.3
24	8 29 0.04	2.177	19 27 2.9	7.34	0.789 4750	192.4	15.28	1.43	22 19.3
25	8 29 52.18	2.168	19 24 6.5	7.35	0.789 0062	198.2	15.30	1.43	22 16.2
26	8 30 44.10	+2.159	+19 21 10.0	−7.36	0.788 5236	−204.0	15.32	1.43	22 13.2
27	8 31 35.81	2.150	19 18 13.2	7.37	0.788 0271	209.8	15.33	1.43	22 10.1
28	8 32 27.30	2.140	19 15 16.3	7.37	0.787 5168	215.5	15.35	1.44	22 7.0
29	8 33 18.55	2.131	19 12 19.3	7.37	0.786 9927	221.3	15.37	1.44	22 3.9
30	8 34 9.58	2.121	19 9 22.3	7.38	0.786 4548	227.0	15.39	1.44	22 0.8
31	8 35 0.37	+2.111	+19 6 25.2	−7.38	0.785 9033	−232.6	15.41	1.44	21 57.7
t. 1	8 35 50.92	2.101	19 3 28.1	7.38	0.785 3382	238.3	15.43	1.44	21 54.6
2	8 36 41.23	2.091	19 0 31.0	7.38	0.784 7595	243.9	15.45	1.44	21 51.5
3	8 37 31.28	2.080	18 57 34.0	7.38	0.784 1673	249.5	15.47	1.45	21 48.4
4	8 38 21.07	2.069	18 54 37.0	7.37	0.783 5617	255.1	15.49	1.45	21 45.3
5	8 39 10.60	+2.058	+18 51 40.2	−7.36	0.782 9427	−260.7	15.51	1.45	21 42.2
6	8 39 59.86	2.047	18 48 43.5	7.36	0.782 3102	266.3	15.54	1.45	21 39.1
7	8 40 48.84	2.035	18 45 47.1	7.35	0.781 6644	271.9	15.56	1.45	21 35.9
8	8 41 37.55	2.024	18 42 50.8	7.34	0.781 0053	277.4	15.58	1.46	21 32.8
9	8 42 25.99	2.012	18 39 54.8	7.33	0.780 3329	282.9	15.61	1.46	21 29.7
10	8 43 14.14	+2.000	+18 36 59.0	−7.32	0.779 6472	−288.4	15.63	1.46	21 26.5
11	8 44 2.00	1.988	18 34 3.6	7.30	0.778 9484	293.9	15.66	1.46	21 23.4
12	8 44 49.56	1.976	18 31 8.6	7.28	0.778 2363	299.4	15.68	1.47	21 20.2
13	8 45 36.83	1.963	18 28 14.0	7.27	0.777 5111	304.9	15.71	1.47	21 17.1
14	8 46 23.79	1.950	18 25 19.8	7.25	0.776 7728	310.4	15.74	1.47	21 13.9
15	8 47 10.43	+1.937	+18 22 26.1	−7.23	0.776 0214	−315.9	15.76	1.47	21 10.8
16	8 47 56.75	1.924	18 19 32.9	7.20	0.775 2568	321.3	15.79	1.48	21 7.6
17	8 48 42.76	1.910	18 16 40.3	7.18	0.774 4792	326.7	15.82	1.48	21 4.4
18	8 49 28.43	1.896	18 13 48.3	7.15	0.773 6885	332.2	15.85	1.48	21 1.3
19	8 50 13.77	1.882	18 10 56.9	7.13	0.772 8847	337.6	15.88	1.48	20 58.1
20	8 50 58.77	+1.868	+18 8 6.3	−7.09	0.772 0681	−342.9	15.91	1.49	20 54.9
21	8 51 43.42	1.853	18 5 16.4	7.06	0.771 2386	348.3	15.94	1.49	20 51.7
22	8 52 27.71	1.838	18 2 27.3	7.03	0.770 3963	353.6	15.97	1.49	20 48.5
23	8 53 11.63	1.823	17 59 39.1	6.99	0.769 5412	358.9	16.00	1.50	20 45.3
24	8 53 55.19	1.807	17 56 51.7	6.96	0.768 6736	364.1	16.03	1.50	20 42.0
25	8 54 38.37	+1.792	+17 54 5.2	−6.91	0.767 7934	−369.3	16.07	1.50	20 38.8
26	8 55 21.18	1.775	17 51 19.8	6.87	0.766 9008	374.5	16.10	1.51	20 35.6
27	8 56 3.59	1.759	17 48 35.3	6.83	0.765 9958	379.6	16.13	1.51	20 32.4
28	8 56 45.61	1.743	17 45 51.9	6.79	0.765 0786	384.7	16.17	1.51	20 29.1
29	8 57 27.23	1.726	17 43 9.6	6.74	0.764 1492	389.8	16.20	1.51	20 25.9
30	8 58 8.44	+1.709	+17 40 28.5	−6.69	0.763 2078	−394.8	16.24	1.52	20 22.6
. 1	8 58 49.24	+1.691	+17 37 48.5	−6.64	0.762 2544	−399.7	16.27	1.52	20 19.[illegible]

JUPITER, 1919.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
Oct. 1	8 58 49.24	+1.691	+17 37 48.5	−6.64	0.762 2544	−399.7	16.27	1.52	20 19.3
2	8 59 29.62	1.674	17 35 9.8	6.59	0.761 2892	404.6	16.31	1.52	20 16.1
3	9 0 9.58	1.656	17 32 32.3	6.53	0.760 3124	409.4	16.34	1.53	20 12.8
4	9 0 49.11	1.638	17 29 56.2	6.48	0.759 3239	414.3	16.38	1.53	20 9.6
5	9 1 28.20	1.619	17 27 21.4	6.42	0.758 3240	419.0	16.42	1.54	20 6.3
6	9 2 6.84	+1.601	+17 24 48.0	−6.36	0.757 3128	−423.7	16.46	1.54	20 3.0
7	9 2 45.04	1.583	17 22 16.1	6.30	0.756 2904	428.3	16.50	1.54	19 59.7
8	9 3 22.80	1.564	17 19 45.7	6.24	0.755 2568	433.0	16.54	1.55	19 56.4
9	9 4 0.09	1.544	17 17 16.8	6.17	0.754 2122	437.5	16.58	1.55	19 53.0
10	9 4 36.91	1.525	17 14 49.5	6.10	0.753 1567	442.0	16.62	1.55	19 49.7
11	9 5 13.27	+1.505	+17 12 23.8	−6.04	0.752 0904	−446.5	16.66	1.56	19 46.3
12	9 5 49.16	1.485	17 9 59.8	5.96	0.751 0134	451.0	16.70	1.56	19 43.0
13	9 6 24.56	1.465	17 7 37.6	5.89	0.749 9258	455.4	16.74	1.57	19 39.6
14	9 6 59.47	1.444	17 5 17.1	5.82	0.748 8277	459.7	16.78	1.57	19 36.3
15	9 7 33.89	1.424	17 2 58.4	5.74	0.747 7192	464.0	16.83	1.57	19 33.0
16	9 8 7.80	+1.402	+17 0 41.7	−5.66	0.746 6004	−468.3	16.87	1.58	19 29.6
17	9 8 41.20	1.381	16 58 26.8	5.58	0.745 4716	472.4	16.91	1.58	19 26.2
18	9 9 14.07	1.359	16 56 13.9	5.50	0.744 3328	476.6	16.96	1.59	19 22.8
19	9 9 46.42	1.337	16 54 3.0	5.41	0.743 1842	480.6	17.00	1.59	19 19.4
20	9 10 18.24	1.315	16 51 54.2	5.32	0.742 0261	484.5	17.05	1.59	19 16.0
21	9 10 49.52	+1.292	+16 49 47.6	−5.23	0.740 8585	−488.4	17.09	1.60	19 12.5
22	9 11 20.24	1.269	16 47 43.2	5.14	0.739 6819	492.2	17.14	1.60	19 9.1
23	9 11 50.41	1.245	16 45 41.0	5.04	0.738 4963	495.8	17.19	1.61	19 5.7
24	9 12 20.01	1.222	16 43 41.2	4.95	0.737 3019	499.5	17.23	1.61	19 2.2
25	9 12 49.05	1.198	16 41 43.6	4.85	0.736 0989	503.0	17.28	1.62	18 58.7
26	9 13 17.50	+1.173	+16 39 48.5	−4.75	0.734 8877	−506.4	17.33	1.62	18 55.3
27	9 13 45.37	1.149	16 37 55.8	4.65	0.733 6684	509.7	17.38	1.62	18 51.8
28	9 14 12.65	1.124	16 36 5.5	4.54	0.732 4413	512.9	17.43	1.63	18 48.3
29	9 14 39.34	1.099	16 34 17.7	4.44	0.731 2065	516.0	17.48	1.63	18 44.8
30	9 15 5.42	1.074	16 32 32.5	4.33	0.729 9645	519.0	17.53	1.64	18 41.3
31	9 15 30.89	+1.049	+16 30 49.9	−4.22	0.728 7154	−521.9	17.58	1.64	18 37.8
Nov. 1	9 15 55.75	1.023	16 29 9.9	4.11	0.727 4594	524.7	17.63	1.65	18 34.3
2	9 16 19.98	0.997	16 27 32.6	4.00	0.726 1970	527.4	17.68	1.65	18 30.7
3	9 16 43.59	0.971	16 25 58.1	3.88	0.724 9282	529.9	17.73	1.66	18 27.2
4	9 17 6.57	0.944	16 24 26.3	3.77	0.723 6535	532.3	17.78	1.66	18 23.6
5	9 17 28.91	+0.917	+16 22 57.3	−3.65	0.722 3730	−534.7	17.84	1.67	18 20.1
6	9 17 50.60	0.890	16 21 31.2	3.53	0.721 0871	536.9	17.89	1.67	18 16.5
7	9 18 11.64	0.863	16 20 8.0	3.41	0.719 7960	539.0	17.94	1.68	18 12.9
8	9 18 32.03	0.836	16 18 47.7	3.29	0.718 4999	541.0	18.00	1.68	18 9.3
9	9 18 51.76	0.808	16 17 30.3	3.16	0.717 1991	543.0	18.05	1.69	18 5.7
10	9 19 10.82	+0.780	+16 16 16.0	−3.03	0.715 8938	−544.8	18.10	1.69	18 2.1
11	9 19 29.21	0.752	16 15 4.7	2.90	0.714 5844	546.4	18.16	1.70	17 58.5
12	9 19 46.91	0.723	16 13 56.5	2.78	0.713 2711	548.0	18.21	1.70	17 54.8
13	9 20 3.93	0.695	16 12 51.5	2.64	0.711 9543	549.4	18.27	1.71	17 51.1
14	9 20 20.25	0.665	16 11 49.7	2.51	0.710 6343	550.6	18.32	1.71	17 47.5
15	9 20 35.87	+0.636	+16 10 51.1	−2.37	0.709 3114	−551.8	18.38	1.72	17 43.8
16	9 20 50.78	+0.606	+16 9 55.8	−2.24	0.707 9860	−552.7	18.44	1.72	17 40.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
ov. 16	9 20 50.78	+0.606	+16 9 55.8	−2.24	0.707 9860	−552.7	18.44	1.72	17 40.1
17	9 21 4.98	0.577	16 9 3.8	2.10	0.706 6586	553.5	18.49	1.73	17 36.4
18	9 21 18.46	0.546	16 8 15.2	1.95	0.705 3294	554.1	18.55	1.73	17 32.6
19	9 21 31.20	0.516	16 7 30.0	1.81	0.703 9990	554.5	18.61	1.74	17 28.9
20	9 21 43.22	0.485	16 6 48.2	1.67	0.702 6677	554.8	18.66	1.74	17 25.2
21	9 21 54.50	+0.455	+16 6 9.8	−1.53	0.701 3359	−554.9	18.72	1.75	17 21.4
22	9 22 5.04	0.424	16 5 34.8	1.38	0.700 0041	554.9	18.78	1.76	17 17.6
23	9 22 14.83	0.392	16 5 3.4	1.23	0.698 6727	554.6	18.84	1.76	17 13.9
24	9 22 23.87	0.361	16 4 35.5	1.09	0.697 3421	554.2	18.89	1.77	17 10.1
25	9 22 32.16	0.330	16 4 11.1	0.94	0.696 0128	553.5	18.95	1.77	17 6.3
26	9 22 39.69	+0.298	+16 3 50.3	−0.79	0.694 6853	−552.7	19.01	1.78	17 2.5
27	9 22 46.46	0.266	16 3 33.0	0.65	0.693 3600	551.7	19.07	1.78	16 58.6
28	9 22 52.47	0.234	16 3 19.3	0.50	0.692 0374	550.4	19.13	1.79	16 54.8
29	9 22 57.70	0.202	16 3 9.2	0.34	0.690 7180	549.0	19.19	1.79	16 51.0
30	9 23 2.17	0.170	16 3 2.8	0.19	0.689 4022	547.4	19.24	1.80	16 47.1
ec. 1	9 23 5.87	+0.138	+16 3 0.0	−0.04	0.688 0907	−545.5	19.30	1.80	16 43.2
2	9 23 8.80	0.106	16 3 0.8	+0.11	0.686 7838	543.5	19.36	1.81	16 39.3
3	9 23 10.95	0.074	16 3 5.3	0.26	0.685 4819	541.3	19.42	1.82	16 35.4
4	9 23 12.33	0.041	16 3 13.4	0.41	0.684 1856	538.9	19.48	1.82	16 31.5
5	9 23 12.93	+0.009	16 3 25.1	0.56	0.682 8953	536.3	19.53	1.83	16 27.6
6	9 23 12.76	−0.023	+16 3 40.5	+0.72	0.681 6116	−533.4	19.59	1.83	16 23.6
7	9 23 11.81	0.056	16 3 59.5	0.87	0.680 3349	530.4	19.65	1.84	16 19.7
8	9 23 10.09	0.088	16 4 22.2	1.02	0.679 0656	527.3	19.71	1.84	16 15.7
9	9 23 7.58	0.121	16 4 48.5	1.17	0.677 8042	523.9	19.76	1.85	16 11.7
10	9 23 4.30	0.153	16 5 18.4	1.32	0.676 5512	520.2	19.82	1.85	16 7.7
11	9 23 0.23	−0.186	+16 5 52.0	+1.47	0.675 3073	−516.3	19.88	1.86	16 3.7
12	9 22 55.39	0.218	16 6 29.2	1.63	0.674 0729	512.2	19.93	1.86	15 59.7
13	9 22 49.77	0.250	16 7 10.1	1.78	0.672 8487	507.9	19.99	1.87	15 55.7
14	9 22 43.37	0.283	16 7 54.6	1.93	0.671 6351	503.4	20.05	1.87	15 51.6
15	9 22 36.19	0.315	16 8 42.7	2.08	0.670 4328	498.5	20.10	1.88	15 47.6
16	9 22 28.23	−0.348	+16 9 34.4	+2.23	0.669 2424	−493.5	20.16	1.88	15 43.5
17	9 22 19.50	0.380	16 10 29.6	2.37	0.668 0643	488.2	20.21	1.89	15 39.4
18	9 22 10.00	0.412	16 11 28.3	2.52	0.666 8992	482.6	20.27	1.89	15 35.3
19	9 21 59.73	0.444	16 12 30.6	2.67	0.665 7478	476.8	20.32	1.90	15 31.2
20	9 21 48.70	0.475	16 13 36.3	2.81	0.664 6106	470.8	20.37	1.90	15 27.1
21	9 21 36.91	−0.507	+16 14 45.4	+2.95	0.663 4883	−464.4	20.43	1.91	15 22.9
22	9 21 24.37	0.538	16 15 57.9	3.09	0.662 3815	457.9	20.48	1.91	15 18.8
23	9 21 11.09	0.569	16 17 13.7	3.23	0.661 2907	451.1	20.53	1.92	15 14.6
24	9 20 57.07	0.599	16 18 32.8	3.37	0.660 2166	444.0	20.58	1.92	15 10.5
25	9 20 42.32	0.630	16 19 55.2	3.50	0.659 1598	436.6	20.63	1.93	15 6.3
26	9 20 26.84	−0.660	+16 21 20.7	+3.63	0.658 1209	−429.1	20.68	1.93	15 2.1
27	9 20 10.66	0.689	16 22 49.3	3.76	0.657 1003	421.3	20.73	1.94	14 57.9
28	9 19 53.77	0.718	16 24 21.0	3.88	0.656 0987	413.3	20.78	1.94	14 53.6
29	9 19 36.19	0.747	16 25 55.7	4.01	0.655 1166	405.1	20.82	1.95	14 49.4
30	9 19 17.93	0.775	16 27 33.3	4.13	0.654 1546	396.6	20.87	1.95	14 45.2
31	9 18 59.00	−0.803	+16 29 13.8	+4.25	0.653 2131	−387.9	20.92	1.96	14 40.9
32	9 18 39.41	−0.830	+16 30 57.1	+4.36	0.652 2928	−379.0	20.96	1.96	14

JUPITER, 1919.

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	′ ″	″	° ′ ″	″		
Jan.	3	100 52 20.2	5 1.42	+ 1.2	+0 1 45.0	+6.89	0.714 3646	+303.4
	7	101 12 25.6	5 1.26	1.5	0 2 12.6	6.89	0.714 4859	303.2
	11	101 32 30.3	5 1.09	1.8	0 2 40.1	6.88	0.714 6072	303.2
	15	101 52 34.3	5 0.91	2.1	0 3 7.6	6.86	0.714 7285	303.2
	19	102 12 37.6	5 0.75	2.4	0 3 35.0	6.86	0.714 8498	303.2
	23	102 32 40.3	5 0.59	+ 2.7	+0 4 2.5	+6.86	0.714 9711	+303.1
	27	102 52 42.3	5 0.43	3.0	0 4 29.9	6.85	0.715 0923	303.0
	31	103 12 43.7	5 0.25	3.3	0 4 57.3	6.84	0.715 2135	303.0
Feb.	4	103 32 44.3	5 0.09	3.7	0 5 24.6	6.83	0.715 3347	302.9
	8	103 52 44.4	4 59.93	4.0	0 5 51.9	6.82	0.715 4558	302.7
	12	104 12 43.7	4 59.75	+ 4.3	+0 6 19.2	+6.82	0.715 5769	+302.7
	16	104 32 42.4	4 59.59	4.6	0 6 46.5	6.82	0.715 6980	302.7
	20	104 52 40.4	4 59.41	4.9	0 7 13.8	6.81	0.715 8191	302.5
	24	105 12 37.7	4 59.25	5.2	0 7 41.0	6.80	0.715 9400	302.4
	28	105 32 34.4	4 59.09	5.5	0 8 8.2	6.80	0.716 0610	302.3
Mar.	4	105 52 30.4	4 58.91	+ 5.8	+0 8 35.4	+6.79	0.716 1818	+302.0
	8	106 12 25.7	4 58.75	6.1	0 9 2.5	6.78	0.716 3026	301.9
	12	106 32 20.4	4 58.60	6.4	0 9 29.6	6.76	0.716 4233	301.8
	16	106 52 14.5	4 58.44	6.7	0 9 56.6	6.75	0.716 5440	301.5
	20	107 12 7.9	4 58.26	7.0	0 10 23.6	6.75	0.716 6645	301.2
	24	107 32 0.6	4 58.10	+ 7.3	+0 10 50.6	+6.75	0.716 7850	+301.1
	28	107 51 52.7	4 57.94	7.6	0 11 17.6	6.74	0.716 9054	300.9
Apr.	1	108 11 44.1	4 57.76	7.9	0 11 44.5	6.72	0.717 0257	300.6
	5	108 31 34.8	4 57.60	8.2	0 12 11.4	6.71	0.717 1459	300.4
	9	108 51 24.9	4 57.44	8.5	0 12 38.2	6.71	0.717 2660	300.1
	13	109 11 14.3	4 57.26	+ 8.8	+0 13 5.1	+6.70	0.717 3860	+299.7
	17	109 31 3.0	4 57.11	9.1	0 13 31.8	6.69	0.717 5058	299.5
	21	109 50 51.2	4 56.95	9.4	0 13 58.5	6.68	0.717 6256	299.4
	25	110 10 38.6	4 56.79	9.7	0 14 25.2	6.66	0.717 7453	299.0
	29	110 30 25.5	4 56.64	10.0	0 14 51.8	6.65	0.717 8648	298.6
May	3	110 50 11.7	4 56.46	+10.2	+0 15 18.4	+6.64	0.717 9842	+298.4
	7	111 9 57.2	4 56.29	10.5	0 15 44.9	6.63	0.718 1035	298.1
	11	111 29 42.0	4 56.12	10.8	0 16 11.4	6.62	0.718 2227	297.9
	15	111 49 26.2	4 55.98	11.1	0 16 37.9	6.61	0.718 3418	297.5
	19	112 9 9.8	4 55.81	11.4	0 17 4.3	6.60	0.718 4607	297.1
	23	112 28 52.7	4 55.64	+11.6	+0 17 30.7	+6.59	0.718 5795	+296.8
	27	112 48 34.9	4 55.47	11.9	0 17 57.0	6.56	0.718 6981	296.4
	31	113 8 16.5	4 55.32	12.2	0 18 23.2	6.55	0.718 8166	296.0
June	4	113 27 57.5	4 55.18	12.5	0 18 49.4	6.54	0.718 9349	295.6
	8	113 47 37.9	4 55.01	12.7	0 19 15.5	6.53	0.719 0531	295.2
	12	114 7 17.6	4 54.85	+13.0	+0 19 41.6	+6.52	0.719 1711	+294.9
	16	114 26 56.7	4 54.69	13.3	0 20 7.7	6.51	0.719 2890	294.5
	20	114 46 35.1	4 54.52	13.5	0 20 33.7	6.49	0.719 4067	294.0
	24	115 6 12.9	4 54.38	13.8	0 20 59.6	6.48	0.719 5242	293.6
	28	115 25 50.1	4 54.21	14.1	0 21 25.5	6.46	0.719 6416	293.3
July	2	115 45 26.6	4 54.05	+14.3	+0 21 51.3	+6.45	0.719 7588	+292.8
	6	116 5 2.5	4 53.90	+14.6	+0 22 17.1	+6.44	0.719 8758	+292.2

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	′ ″	″	° ′ ″	″		
July	2	115 45 26.6	4 54.05	+14.3	+0 21 51.3	+6.45	0.719 7588	+292.8
	6	116 5 2.5	4 53.90	14.6	0 22 17.1	6.44	0.719 8758	292.2
	10	116 24 37.8	4 53.74	14.8	0 22 42.8	6.42	0.719 9926	291.7
	14	116 44 12.4	4 53.59	15.1	0 23 8.5	6.40	0.720 1092	291.4
	18	117 3 46.5	4 53.44	15.4	0 23 34.0	6.39	0.720 2257	291.0
	22	117 23 19.9	4 53.26	+15.6	+0 23 59.6	+6.38	0.720 3420	+290.5
	26	117 42 52.6	4 53.11	15.8	0 24 25.0	6.36	0.720 4581	289.9
	30	118 2 24.8	4 52.96	16.1	0 24 50.5	6.35	0.720 5739	289.4
Aug.	3	118 21 56.3	4 52.78	16.3	0 25 15.8	6.34	0.720 6896	289.0
	7	118 41 27.1	4 52.64	16.6	0 25 41.2	6.32	0.720 8051	288.5
	11	119 0 57.4	4 52.50	+16.8	+0 26 6.4	+6.30	0.720 9204	+287.9
	15	119 20 27.1	4 52.34	17.0	0 26 31.6	6.29	0.721 0354	287.4
	19	119 39 56.1	4 52.19	17.3	0 26 56.7	6.26	0.721 1503	286.9
	23	119 59 24.6	4 52.04	17.5	0 27 21.7	6.24	0.721 2649	286.3
	27	120 18 52.4	4 51.87	17.7	0 27 46.6	6.23	0.721 3793	285.8
	31	120 38 19.6	4 51.72	+18.0	+0 28 11.5	+6.22	0.721 4935	+285.1
Sept.	4	120 57 46.2	4 51.58	18.2	0 28 36.4	6.21	0.721 6074	284.5
	8	121 17 12.2	4 51.41	18.4	0 29 1.2	6.19	0.721 7211	284.0
	12	121 36 37.5	4 51.26	18.6	0 29 25.9	6.16	0.721 8346	283.5
	16	121 56 2.3	4 51.15	18.8	0 29 50.5	6.15	0.721 9479	282.9
	20	122 15 26.5	4 50.98	+19.1	+0 30 15.1	+6.14	0.722 0609	+282.1
	24	122 34 50.1	4 50.82	19.3	0 30 39.6	6.11	0.722 1736	281.5
	28	122 54 13.1	4 50.68	19.5	0 31 4.0	6.10	0.722 2861	281.0
Oct.	2	123 13 35.5	4 50.52	19.7	0 31 28.4	6.08	0.722 3984	280.4
	6	123 32 57.3	4 50.38	19.9	0 31 52.6	6.05	0.722 5104	279.6
	10	123 52 18.5	4 50.22	+20.1	+0 32 16.8	+6.05	0.722 6221	+279.0
	14	124 11 39.1	4 50.09	20.3	0 32 41.0	6.02	0.722 7336	278.4
	18	124 30 59.2	4 49.94	20.5	0 33 5.0	6.00	0.722 8448	277.8
	22	124 50 18.6	4 49.79	20.7	0 33 29.0	6.00	0.722 9558	277.0
	26	125 9 37.5	4 49.64	20.9	0 33 53.0	5.98	0.723 0664	276.2
	30	125 28 55.7	4 49.49	+21.1	+0 34 16.8	+5.95	0.723 1768	+275.6
Nov.	3	125 48 13.4	4 49.35	21.3	0 34 40.6	5.94	0.723 2869	275.0
	7	126 7 30.5	4 49.20	21.4	0 35 4.3	5.90	0.723 3968	274.2
	11	126 26 47.0	4 49.06	21.6	0 35 27.8	5.88	0.723 5063	273.5
	15	126 46 3.0	4 48.93	21.8	0 35 51.3	5.87	0.723 6156	272.9
	19	127 5 18.4	4 48.78	+22.0	+0 36 14.8	+5.85	0.723 7246	+272.1
	23	127 24 33.2	4 48.62	22.1	0 36 38.1	5.83	0.723 8333	271.2
	27	127 43 47.4	4 48.47	22.3	0 37 1.4	5.81	0.723 9416	270.5
Dec.	1	128 3 1.0	4 48.34	22.5	0 37 24.6	5.80	0.724 0497	269.9
	5	128 22 14.1	4 48.20	22.6	0 37 47.8	5.78	0.724 1575	269.1
	9	128 41 26.6	4 48.05	+22.8	+0 38 10.8	+5.74	0.724 2650	+268.2
	13	129 0 38.5	4 47.91	23.0	0 38 33.7	5.72	0.724 3721	267.5
	17	129 19 49.9	4 47.78	23.1	0 38 56.6	5.71	0.724 4790	266.8
	21	129 39 0.7	4 47.64	23.3	0 39 19.4	5.68	0.724 5855	265.9
	25	129 58 11.0	4 47.50	23.4	0 39 42.0	5.65	0.724 6917	265.1
	29	130 17 20.7	4 47.36	+23.6	+0 40 4.6	+5.65	0.724 7976	+264.2
	33	130 36 29.9	4 47.23	+23.7	+0 40 27.2	+5.63	0.724 9031	+263.4

SATURN, 1919.

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
		h m s	s	° ′ ″	″			″	″	h m
Jan.	1	10 1 47.96	−0.379	+13 31 13.0	+2.59	0.930 0273	−260.2	9.10	1.03	15 18.8
	2	10 1 38.69	0.394	13 32 16.1	2.67	0.929 4077	256.1	9.11	1.04	15 14.7
	3	10 1 29.03	0.410	13 33 21.2	2.75	0.928 7980	251.9	9.13	1.04	15 10.6
	4	10 1 19.00	0.426	13 34 28.1	2.83	0.928 1986	247.6	9.14	1.04	15 6.5
	5	10 1 8.59	0.441	13 35 36.9	2.90	0.927 6098	243.1	9.15	1.04	15 2.4
	6	10 0 57.83	−0.456	+13 36 47.5	+2.98	0.927 0317	−238.6	9.17	1.04	14 58.3
	7	10 0 46.71	0.471	13 37 59.9	3.05	0.926 4648	233.9	9.18	1.04	14 54.2
	8	10 0 35.23	0.485	13 39 14.0	3.12	0.925 9091	229.2	9.19	1.04	14 50.1
	9	10 0 23.41	0.500	13 40 29.7	3.19	0.925 3649	224.3	9.20	1.05	14 46.0
	10	10 0 11.25	0.514	13 41 47.1	3.26	0.924 8325	219.3	9.21	1.05	14 41.8
	11	9 59 58.76	−0.527	+13 43 6.1	+3.33	0.924 3122	−214.2	9.22	1.05	14 37.7
	12	9 59 45.95	0.541	13 44 26.7	3.39	0.923 8042	209.1	9.23	1.05	14 33.5
	13	9 59 32.81	0.554	13 45 48.8	3.45	0.923 3087	203.8	9.24	1.05	14 29.4
	14	9 59 19.37	0.566	13 47 12.4	3.51	0.922 8259	198.5	9.25	1.05	14 25.2
	15	9 59 5.62	0.579	13 48 37.4	3.57	0.922 3559	193.1	9.26	1.05	14 21.1
	16	9 58 51.57	−0.591	+13 50 3.8	+3.63	0.921 8990	−187.6	9.27	1.05	14 16.9
	17	9 58 37.24	0.603	13 51 31.5	3.68	0.921 4555	182.0	9.28	1.05	14 12.7
	18	9 58 22.62	0.615	13 53 0.6	3.74	0.921 0255	176.3	9.29	1.06	14 8.5
	19	9 58 7.72	0.627	13 54 30.8	3.79	0.920 6092	170.6	9.30	1.06	14 4.4
	20	9 57 52.55	0.638	13 56 2.3	3.84	0.920 2068	164.7	9.31	1.06	14 0.2
	21	9 57 37.12	−0.648	+13 57 35.0	+3.89	0.919 8186	−158.8	9.32	1.06	13 56.0
	22	9 57 21.44	0.658	13 59 8.8	3.93	0.919 4447	152.8	9.33	1.06	13 51.8
	23	9 57 5.52	0.668	14 0 43.5	3.97	0.919 0854	146.7	9.33	1.06	13 47.6
	24	9 56 49.37	0.678	14 2 19.3	4.01	0.918 7408	140.5	9.34	1.06	13 43.4
	25	9 56 32.99	0.687	14 3 56.0	4.05	0.918 4111	134.2	9.35	1.06	13 39.2
	26	9 56 16.38	−0.696	+14 5 33.6	+4.08	0.918 0965	−127.9	9.35	1.06	13 35.0
	27	9 55 59.57	0.705	14 7 12.0	4.12	0.917 7972	121.5	9.36	1.06	13 30.7
	28	9 55 42.56	0.713	14 8 51.3	4.15	0.917 5132	115.1	9.37	1.06	13 26.5
	29	9 55 25.35	0.721	14 10 31.3	4.18	0.917 2449	108.6	9.37	1.07	13 22.3
	30	9 55 7.96	0.728	14 12 12.0	4.21	0.916 9922	102.0	9.38	1.07	13 18.1
	31	9 54 50.41	−0.735	+14 13 53.2	+4.23	0.916 7555	− 95.3	9.38	1.07	13 13.9
Feb.	1	9 54 32.70	0.741	14 15 35.0	4.25	0.916 5348	88.6	9.39	1.07	13 9.6
	2	9 54 14.84	0.747	14 17 17.3	4.27	0.916 3303	81.8	9.39	1.07	13 5.4
	3	9 53 56.84	0.753	14 19 0.0	4.29	0.916 1420	75.1	9.40	1.07	13 1.2
	4	9 53 38.72	0.758	14 20 43.0	4.30	0.915 9700	68.3	9.40	1.07	12 57.0
	5	9 53 20.48	−0.762	+14 22 26.3	+4.31	0.915 8143	− 61.4	9.40	1.07	12 52.7
	6	9 53 2.13	0.767	14 24 9.9	4.32	0.915 6751	54.6	9.41	1.07	12 48.5
	7	9 52 43.69	0.770	14 25 53.7	4.33	0.915 5523	47.7	9.41	1.07	12 44.3
	8	9 52 25.17	0.773	14 27 37.5	4.33	0.915 4462	40.8	9.41	1.07	12 40.0
	9	9 52 6.57	0.776	14 29 21.5	4.33	0.915 3566	33.9	9.41	1.07	12 35.8
	10	9 51 47.92	−0.778	+14 31 5.4	+4.33	0.915 2837	− 26.9	9.42	1.07	12 31.5
	11	9 51 29.21	0.781	14 32 49.3	4.33	0.915 2274	20.0	9.42	1.07	12 27.3
	12	9 51 10.46	0.782	14 34 33.0	4.32	0.915 1877	13.1	9.42	1.07	12 23.0
	13	9 50 51.68	0.783	14 36 16.6	4.31	0.915 1646	− 6.2	9.42	1.07	12 18.8
	14	9 50 32.88	0.784	14 37 59.9	4.30	0.915 1581	+ 0.8	9.42	1.07	12 14.6
	15	9 50 14.07	−0.784	+14 39 43.0	+4.29	0.915 1683	+ 7.7	9.42	1.07	12 10.3
	16	9 49 55.26	−0.784	+14 41 25.8	+4.28	0.915 1950	+ 14.6	9.42	1.07	12 6.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
Feb. 16	9 49 55.26	−0.784	+14 41 25.8	+4.28	0.915 1950	+ 14.6	9.42	1.07	12 6.1
17	9 49 36.46	0.783	14 43 8.2	4.26	0.915 2383	21.5	9.42	1.07	12 1.8
18	9 49 17.68	0.782	14 44 50.3	4.24	0.915 2982	28.4	9.42	1.07	11 57.6
19	9 48 58.93	0.780	14 46 31.8	4.22	0.915 3745	35.2	9.41	1.07	11 53.3
20	9 48 40.23	0.778	14 48 12.7	4.19	0.915 4674	42.2	9.41	1.07	11 49.1
21	9 48 21.58	−0.776	+14 49 53.1	+4.17	0.915 5768	+ 49.0	9.41	1.07	11 44.9
22	9 48 2.98	0.773	14 51 32.9	4.14	0.915 7026	55.8	9.41	1.07	11 40.6
23	9 47 44.46	0.770	14 53 11.9	4.11	0.915 8448	62.7	9.40	1.07	11 36.4
24	9 47 26.03	0.766	14 54 50.1	4.08	0.916 0033	69.4	9.40	1.07	11 32.1
25	9 47 7.69	0.762	14 56 27.5	4.04	0.916 1780	76.2	9.40	1.07	11 27.9
26	9 46 49.45	−0.758	+14 58 4.1	+4.01	0.916 3689	+ 82.9	9.39	1.07	11 23.7
27	9 46 31.33	0.752	14 59 39.8	3.97	0.916 5759	89.6	9.39	1.07	11 19.4
28	9 46 13.34	0.747	15 1 14.5	3.92	0.916 7989	96.2	9.38	1.07	11 15.2
Mar. 1	9 45 55.48	0.741	15 2 48.2	3.88	0.917 0377	102.8	9.38	1.07	11 11.0
2	9 45 37.77	0.735	15 4 20.9	3.84	0.917 2922	109.3	9.37	1.07	11 6.8
3	9 45 20.22	−0.728	+15 5 52.5	+3.79	0.917 5623	+115.8	9.37	1.06	11 2.5
4	9 45 2.84	0.720	15 7 22.8	3.74	0.917 8479	122.2	9.36	1.06	10 58.3
5	9 44 45.64	0.713	15 8 51.9	3.69	0.918 1488	128.5	9.35	1.06	10 54.1
6	9 44 28.63	0.705	15 10 19.7	3.63	0.918 4648	134.8	9.35	1.06	10 49.9
7	9 44 11.82	0.696	15 11 46.3	3.58	0.918 7957	141.0	9.34	1.06	10 45.7
8	9 43 55.21	−0.688	+15 13 11.5	+3.52	0.919 1414	+147.1	9.33	1.06	10 41.5
9	9 43 38.82	0.678	15 14 35.3	3.46	0.919 5016	153.1	9.32	1.06	10 37.3
10	9 43 22.66	0.669	15 15 57.8	3.41	0.919 8760	159.0	9.32	1.06	10 33.1
11	9 43 6.73	0.659	15 17 18.8	3.34	0.920 2646	164.8	9.31	1.06	10 28.9
12	9 42 51.04	0.649	15 18 38.3	3.28	0.920 6671	170.6	9.30	1.06	10 24.7
13	9 42 35.60	−0.638	+15 19 56.3	+3.22	0.921 0834	+176.3	9.29	1.06	10 20.5
14	9 42 20.42	0.627	15 21 12.7	3.15	0.921 5132	181.9	9.28	1.05	10 16.3
15	9 42 5.51	0.616	15 22 27.6	3.09	0.921 9563	187.3	9.27	1.05	10 12.2
16	9 41 50.87	0.604	15 23 40.8	3.02	0.922 4124	192.8	9.26	1.05	10 8.0
17	9 41 36.50	0.593	15 24 52.4	2.95	0.922 8815	198.1	9.25	1.05	10 3.8
18	9 41 22.43	−0.580	+15 26 2.3	+2.88	0.923 3632	+203.3	9.24	1.05	9 59.6
19	9 41 8.64	0.568	15 27 10.5	2.80	0.923 8574	208.5	9.23	1.05	9 55.5
20	9 40 55.16	0.555	15 28 16.9	2.73	0.924 3638	213.5	9.22	1.05	9 51.3
21	9 40 41.98	0.543	15 29 21.6	2.66	0.924 8822	218.5	9.21	1.05	9 47.2
22	9 40 29.12	0.529	15 30 24.6	2.59	0.925 4124	223.4	9.20	1.05	9 43.1
23	9 40 16.58	−0.516	+15 31 25.7	+2.51	0.925 9542	+228.1	9.19	1.04	9 38.9
24	9 40 4.37	0.502	15 32 25.0	2.43	0.926 5073	232.8	9.18	1.04	9 34.8
25	9 39 52.49	0.488	15 33 22.4	2.35	0.927 0716	237.4	9.16	1.04	9 30.6
26	9 39 40.95	0.474	15 34 17.9	2.28	0.927 6467	241.9	9.15	1.04	9 26.5
27	9 39 29.75	0.459	15 35 11.6	2.20	0.928 2325	246.3	9.14	1.04	9 22.4
28	9 39 18.91	−0.444	+15 36 3.3	+2.11	0.928 8287	+250.5	9.13	1.04	9 18.3
29	9 39 8.42	0.429	15 36 53.0	2.03	0.929 4349	254.7	9.11	1.04	9 14.2
30	9 38 58.30	0.414	15 37 40.8	1.95	0.930 0510	258.7	9.10	1.03	9 10.1
31	9 38 48.54	0.399	15 38 26.6	1.87	0.930 6767	262.6	9.09	1.03	9 6.0
Apr. 1	9 38 39.15	0.383	15 39 10.4	1.78	0.931 3116	266.4	9.07	1.03	9 1.9
2	9 38 30.14	−0.368	+15 39 52.1	+1.70	0.931 9555	+270.1	9.06	1.03	8 57.8
3	9 38 21.51	−0.352	+15 40 31.8	+1.61	0.932 6082	+273.7	9.05	1.03	8 53.[illegible]

SATURN, 1919.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Apr. 1	9 38 39.15	−0.383	+15 39 10.4	+1.78	0.931 3116	+266.4	9.07	1.03	9 1.9
2	9 38 30.14	0.368	15 39 52.1	1.70	0.931 9555	270.1	9.06	1.03	8 57.8
3	9 38 21.51	0.352	15 40 31.8	1.61	0.932 6082	273.7	9.05	1.03	8 53.8
4	9 38 13.27	0.335	15 41 9.5	1.52	0.933 2693	277.2	9.03	1.03	8 49.7
5	9 38 5.43	0.319	15 41 45.0	1.43	0.933 9386	280.6	9.02	1.03	8 45.7
6	9 37 57.97	−0.302	+15 42 18.5	+1.35	0.934 6159	+283.8	9.01	1.02	8 41.6
7	9 37 50.92	0.286	15 42 50.0	1.27	0.935 3007	286.9	8.99	1.02	8 37.6
8	9 37 44.26	0.269	15 43 19.3	1.18	0.935 9929	289.9	8.98	1.02	8 33.5
9	9 37 38.01	0.252	15 43 46.6	1.09	0.936 6920	292.7	8.96	1.02	8 29.5
10	9 37 32.16	0.235	15 44 11.8	1.00	0.937 3978	295.5	8.95	1.02	8 25.5
11	9 37 26.72	−0.218	+15 44 34.8	+0.92	0.938 1101	+298.1	8.93	1.02	8 21.4
12	9 37 21.68	0.201	15 44 55.8	0.83	0.938 8286	300.6	8.92	1.01	8 17.4
13	9 37 17.05	0.184	15 45 14.6	0.74	0.939 5531	303.1	8.90	1.01	8 13.4
14	9 37 12.83	0.167	15 45 31.3	0.65	0.940 2833	305.4	8.89	1.01	8 9.4
15	9 37 9.02	0.150	15 45 45.9	0.56	0.941 0189	307.6	8.87	1.01	8 5.4
16	9 37 5.63	−0.133	+15 45 58.4	+0.48	0.941 7598	+309.7	8.86	1.01	8 1.4
17	9 37 2.65	0.115	15 46 8.8	0.39	0.942 5056	311.7	8.84	1.01	7 57.5
18	9 37 0.09	0.098	15 46 17.1	0.30	0.943 2561	313.7	8.83	1.00	7 53.5
19	9 36 57.94	0.081	15 46 23.3	0.21	0.944 0111	315.5	8.81	1.00	7 49.5
20	9 36 56.21	0.063	15 46 27.3	0.12	0.944 7702	317.1	8.80	1.00	7 45.6
21	9 36 54.90	−0.046	+15 46 29.3	+0.04	0.945 5332	+318.7	8.78	1.00	7 41.6
22	9 36 54.01	0.028	15 46 29.1	−0.05	0.946 2999	320.2	8.77	1.00	7 37.7
23	9 36 53.54	−0.011	15 46 26.8	0.14	0.947 0701	321.6	8.75	0.99	7 33.7
24	9 36 53.50	+0.007	15 46 22.4	0.23	0.947 8435	322.9	8.74	0.99	7 29.8
25	9 36 53.87	0.024	15 46 15.9	0.32	0.948 6199	324.1	8.72	0.99	7 25.9
26	9 36 54.66	+0.042	+15 46 7.2	−0.41	0.949 3991	+325.2	8.70	0.99	7 21.9
27	9 36 55.88	0.059	15 45 56.4	0.50	0.950 1808	326.2	8.69	0.99	7 18.0
28	9 36 57.51	0.077	15 45 43.4	0.58	0.950 9648	327.1	8.67	0.99	7 14.2
29	9 36 59.57	0.095	15 45 28.4	0.67	0.951 7506	327.8	8.66	0.98	7 10.3
30	9 37 2.05	0.112	15 45 11.3	0.76	0.952 5382	328.5	8.64	0.98	7 6.4
May 1	9 37 4.96	+0.130	+15 44 52.1	−0.84	0.953 3272	+329.0	8.63	0.98	7 2.5
2	9 37 8.28	0.147	15 44 30.8	0.93	0.954 1173	329.4	8.61	0.98	6 58.6
3	9 37 12.02	0.165	15 44 7.5	1.02	0.954 9084	329.8	8.59	0.98	6 54.7
4	9 37 16.18	0.182	15 43 42.0	1.11	0.955 7002	330.0	8.58	0.98	6 50.9
5	9 37 20.75	0.199	15 43 14.5	1.19	0.956 4924	330.1	8.56	0.97	6 47.0
6	9 37 25.74	+0.216	+15 42 44.9	−1.28	0.957 2848	+330.2	8.55	0.97	6 43.2
7	9 37 31.13	0.233	15 42 13.3	1.36	0.958 0772	330.1	8.53	0.97	6 39.3
8	9 37 36.94	0.250	15 41 39.7	1.44	0.958 8693	330.0	8.52	0.97	6 35.5
9	9 37 43.15	0.267	15 41 4.0	1.53	0.959 6610	329.8	8.50	0.97	6 31.7
10	9 37 49.77	0.284	15 40 26.4	1.61	0.960 4521	329.4	8.49	0.96	6 27.9
11	9 37 56.78	+0.301	+15 39 46.8	−1.69	0.961 2422	+329.0	8.47	0.96	6 24.0
12	9 38 4.20	0.317	15 39 5.2	1.78	0.962 0313	328.5	8.46	0.96	6 20.2
13	9 38 12.01	0.334	15 38 21.6	1.85	0.962 8191	328.0	8.44	0.96	6 16.4
14	9 38 20.22	0.350	15 37 36.1	1.94	0.963 6055	327.3	8.42	0.96	6 12.6
15	9 38 28.81	0.366	15 36 48.6	2.02	0.964 3902	326.6	8.41	0.96	6 8.8
16	9 38 37.80	+0.383	+15 35 59.2	−2.10	0.965 1731	+325.8	8.40	0.95	6 5.1
17	9 38 47.17	+0.399	+15 35 7.9	−2.18	0.965 9541	+325.0	8.38	0.95	6 1.3

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
		h m s	s	° ′ ″	″			″	″	h m
May	17	9 38 47.17	+0.399	+15 35 7.9	−2.18	0.965 9541	+325.0	8.38	0.95	6 1.3
	18	9 38 56.93	0.414	15 34 14.6	2.26	0.966 7328	324.0	8.36	0.95	5 57.5
	19	9 39 7.06	0.430	15 33 19.5	2.34	0.967 5092	323.0	8.35	0.95	5 53.8
	20	9 39 17.58	0.446	15 32 22.5	2.41	0.968 2831	321.9	8.33	0.95	5 50.0
	21	9 39 28.47	0.462	15 31 23.6	2.49	0.969 0542	320.7	8.32	0.95	5 46.2
	22	9 39 39.74	+0.477	+15 30 22.8	−2.57	0.969 8225	+319.5	8.30	0.94	5 42.5
	23	9 39 51.37	0.492	15 29 20.2	2.65	0.970 5877	318.2	8.29	0.94	5 38.8
	24	9 40 3.38	0.508	15 28 15.7	2.72	0.971 3498	316.8	8.28	0.94	5 35.0
	25	9 40 15.75	0.523	15 27 9.4	2.80	0.972 1084	315.4	8.26	0.94	5 31.3
	26	9 40 28.49	0.538	15 26 1.2	2.88	0.972 8635	313.8	8.25	0.94	5 27.6
	27	9 40 41.58	+0.553	+15 24 51.3	−2.95	0.973 6147	+312.2	8.23	0.94	5 23.9
	28	9 40 55.03	0.568	15 23 39.6	3.02	0.974 3620	310.5	8.22	0.93	5 20.2
	29	9 41 8.84	0.583	15 22 26.1	3.10	0.975 1052	308.8	8.20	0.93	5 16.5
	30	9 41 22.99	0.597	15 21 10.8	3.17	0.975 8441	307.0	8.19	0.93	5 12.8
	31	9 41 37.49	0.612	15 19 53.8	3.25	0.976 5785	305.0	8.18	0.93	5 9.1
June	1	9 41 52.34	+0.626	+15 18 35.0	−3.32	0.977 3082	+303.0	8.16	0.93	5 5.4
	2	9 42 7.52	0.640	15 17 14.6	3.39	0.978 0331	301.0	8.15	0.93	5 1.7
	3	9 42 23.04	0.653	15 15 52.4	3.46	0.978 7531	298.9	8.13	0.92	4 58.1
	4	9 42 38.88	0.667	15 14 28.5	3.53	0.979 4680	296.8	8.12	0.92	4 54.4
	5	9 42 55.05	0.681	15 13 3.0	3.60	0.980 1777	294.6	8.11	0.92	4 50.7
	6	9 43 11.55	+0.694	+15 11 35.9	−3.67	0.980 8819	+292.3	8.10	0.92	4 47.1
	7	9 43 28.36	0.707	15 10 7.1	3.73	0.981 5807	290.0	8.08	0.92	4 43.4
	8	9 43 45.48	0.720	15 8 36.8	3.80	0.982 2739	287.6	8.07	0.92	4 39.8
	9	9 44 2.92	0.733	15 7 4.8	3.86	0.982 9613	285.2	8.06	0.92	4 36.1
	10	9 44 20.66	0.745	15 5 31.3	3.93	0.983 6428	282.7	8.05	0.91	4 32.5
	11	9 44 38.70	+0.758	+15 3 56.2	−4.00	0.984 3183	+280.2	8.03	0.91	4 28.9
	12	9 44 57.03	0.770	15 2 19.5	4.06	0.984 9877	277.6	8.02	0.91	4 25.2
	13	9 45 15.66	0.783	15 0 41.4	4.12	0.985 6509	275.0	8.01	0.91	4 21.6
	14	9 45 34.59	0.795	14 59. 1.7	4.18	0.986 3079	272.4	8.00	0.91	4 18.0
	15	9 45 53.80	0.806	14 57 20.6	4.24	0.986 9585	269.7	7.98	0.91	4 14.4
	16	9 46 13.28	+0.818	+14 55 38.0	−4.31	0.987 6025	+267.0	7.97	0.91	4 10.8
	17	9 46 33.05	0.829	14 53 53.9	4.37	0.988 2399	264.2	7.96	0.90	4 7.2
	18	9 46 53.09	0.841	14 52 8.3	4.43	0.988 8706	261.4	7.95	0.90	4 3.6
	19	9 47 13.40	0.852	14 50 21.3	4.49	0.989 4945	258.5	7.94	0.90	4 0.0
	20	9 47 33.98	0.863	14 48 32.9	4.54	0.990 1115	255.6	7.93	0.90	3 56.4
	21	9 47 54.83	+0.874	+14 46 43.1	−4.61	0.990 7215	+252.7	7.91	0.90	3 52.8
	22	9 48 15.94	0.885	14 44 51.8	4.67	0.991 3245	249.7	7.90	0.90	3 49.2
	23	9 48 37.30	0.895	14 42 59.2	4.72	0.991 9201	246.6	7.89	0.90	3 45.6
	24	9 48 58.91	0.906	14 41 5.3	4.78	0.992 5084	243.6	7.88	0.90	3 42.1
	25	9 49 20.78	0.916	14 39 10.0	4.83	0.993 0892	240.4	7.87	0.89	3 38.5
	26	9 49 42.89	+0.926	+14 37 13.4	−4.89	0.993 6624	+237.2	7.86	0.89	3 34.9
	27	9 50 5.24	0.936	14 35 15.5	4.94	0.994 2279	234.0	7.85	0.89	3 31.4
	28	9 50 27.82	0.946	14 33 16.3	4.99	0.994 7856	230.7	7.84	0.89	3 27.8
	29	9 50 50.64	0.956	14 31 15.8	5.05	0.995 3354	227.4	7.83	0.89	3 24.3
	30	9 51 13.69	0.965	14 29 14.0	5.10	0.995 8772	224.1	7.82	0.89	3 20.7
July	1	9 51 36.97	+0.974	+14 27 11.1	−5.15	0.996 4109	+220.7	7.81	0.89	3 17.2
	2	9 52 0.46	+0.983	+14 25 6.9	−5.20	0.996 9365	+217.3	7.80	0.89	3 13.6

SATURN, 1919.

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
		h m s	s	° ′ ″	″			″	″	h m
July	1	9 51 36.97	+0.974	+14 27 11.1	−5.15	0.996 4109	+220.7	7.81	0.89	3 17.2
	2	9 52 0.46	0.983	14 25 6.9	5.20	0.996 9365	217.3	7.80	0.89	3 13.6
	3	9 52 24.16	0.992	14 23 1.6	5.25	0.997 4539	213.9	7.79	0.89	3 10.1
	4	9 52 48.07	1.000	14 20 55.1	5.29	0.997 9630	210.4	7.78	0.88	3 6.6
	5	9 53 12.18	1.009	14 18 47.5	5.34	0.998 4637	206.9	7.77	0.88	3 3.0
	6	9 53 36.49	+1.017	+14 16 38.8	−5.39	0.998 9560	+203.4	7.76	0.88	2 59.5
	7	9 54 1.00	1.025	14 14 29.0	5.43	0.999 4398	199.8	7.76	0.88	2 56.0
	8	9 54 25.69	1.033	14 12 18.1	5.48	0.999 9150	196.2	7.75	0.88	2 52.5
	9	9 54 50.58	1.041	14 10 6.1	5.53	1.000 3816	192.6	7.74	0.88	2 48.9
	10	9 55 15.65	1.048	14 7 52.9	5.57	1.000 8396	189.0	7.73	0.88	2 45.4
	11	9 55 40.90	+1.056	+14 5 38.9	−5.61	1.001 2889	+185.4	7.72	0.88	2 41.9
	12	9 56 6.33	1.063	14 3 23.8	5.65	1.001 7294	181.7	7.72	0.88	2 38.4
	13	9 56 31.93	1.070	14 1 7.7	5.69	1.002 1611	178.0	7.71	0.88	2 34.9
	14	9 56 57.70	1.077	13 58 50.5	5.73	1.002 5840	174.3	7.70	0.88	2 31.4
	15	9 57 23.63	1.084	13 56 32.6	5.77	1.002 9979	170.6	7.69	0.87	2 27.9
	16	9 57 49.72	+1.090	+13 54 13.6	−5.81	1.003 4029	+166.9	7.69	0.87	2 24.4
	17	9 58 15.96	1.097	13 51 53.7	5.85	1.003 7989	163.1	7.68	0.87	2 20.9
	18	9 58 42.36	1.103	13 49 32.8	5.89	1.004 1858	159.3	7.67	0.87	2 17.4
	19	9 59 8.91	1.109	13 47 11.1	5.93	1.004 5636	155.5	7.67	0.87	2 13.9
	20	9 59 35.61	1.115	13 44 48.4	5.96	1.004 9322	151.7	7.66	0.87	2 10.4
	21	10 0 2.44	+1.121	+13 42 24.9	−6.00	1.005 2916	+147.8	7.65	0.87	2 6.9
	22	10 0 29.41	1.127	13 40 0.6	6.03	1.005 6416	143.9	7.65	0.87	2 3.4
	23	10 0 56.52	1.132	13 37 35.5	6.06	1.005 9822	140.0	7.64	0.87	2 0.0
	24	10 1 23.76	1.138	13 35 9.6	6.10	1.006 3134	136.0	7.64	0.87	1 56.5
	25	10 1 51.12	1.143	13 32 42.9	6.13	1.006 6350	132.0	7.63	0.87	1 53.0
	26	10 2 18.60	+1.148	+13 30 15.4	−6.16	1.006 9471	+128.0	7.62	0.87	1 49.5
	27	10 2 46.20	1.153	13 27 47.2	6.19	1.007 2495	124.0	7.62	0.87	1 46.0
	28	10 3 13.92	1.157	13 25 18.4	6.22	1.007 5422	119.9	7.61	0.87	1 42.6
	29	10 3 41.74	1.161	13 22 48.8	6.25	1.007 8252	115.9	7.61	0.86	1 39.1
	30	10 4 9.66	1.166	13 20 18.5	6.28	1.008 0985	111.9	7.60	0.86	1 35.6
	31	10 4 37.69	+1.170	+13 17 47.6	−6.30	1.008 3621	+107.8	7.60	0.86	1 32.2
Aug.	1	10 5 5.81	1.174	13 15 16.2	6.32	1.008 6158	103.7	7.60	0.86	1 28.7
	2	10 5 34.02	1.177	13 12 44.1	6.35	1.008 8598	99.6	7.59	0.86	1 25.2
	3	10 6 2.31	1.180	13 10 11.4	6.38	1.009 0939	95.5	7.59	0.86	1 21.8
	4	10 6 30.68	1.184	13 7 38.1	6.40	1.009 3181	91.4	7.58	0.86	1 18.3
	5	10 6 59.13	+1.187	+13 5 4.3	−6.42	1.009 5324	+ 87.2	7.58	0.86	1 14.9
	6	10 7 27.66	1.190	13 2 30.0	6.44	1.009 7368	83.1	7.58	0.86	1 11.4
	7	10 7 56.26	1.193	12 59 55.3	6.46	1.009 9313	79.0	7.57	0.86	1 7.9
	8	10 8 24.93	1.196	12 57 20.1	6.48	1.010 1158	74.8	7.57	0.86	1 4.5
	9	10 8 53.65	1.198	12 54 44.4	6.50	1.010 2903	70.6	7.57	0.86	1 1.0
	10	10 9 22.44	+1.200	+12 52 8.3	−6.51	1.010 4548	+ 66.5	7.56	0.86	0 57.6
	11	10 9 51.27	1.202	12 49 31.8	6.53	1.010 6093	62.3	7.56	0.86	0 54.1
	12	10 10 20.16	1.205	12 46 54.9	6.55	1.010 7538	58.1	7.56	0.86	0 50.7
	13	10 10 49.09	1.207	12 44 17.6	6.56	1.010 8884	54.0	7.55	0.86	0 47.2
	14	10 11 18.07	1.208	12 41 40.0	6.57	1.011 0129	49.8	7.55	0.86	0 43.8
	15	10 11 47.08	+1.210	+12 39 2.1	−6.59	1.011 1274	+ 45.6	7.55	0.86	0 40.3
	16	*10 12 16.13*	+1.211	+12 36 23.8	−6.60	1.011 2318	+ 41.4	7.55	0.86	0 36.9

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
		h m s	s	° ′ ″	″			″	″	h m
Aug.	16	10 12 16.13	+1.211	+12 36 23.8	−6.60	1.011 2318	+ 41.4	7.55	0.86	0 36.9
	17	10 12 45.22	1.213	12 33 45.2	6.61	1.011 3261	37.2	7.55	0.86	0 33.4
	18	10 13 14.34	1.214	12 31 6.4	6.62	1.011 4103	33.0	7.55	0.86	0 30.0
	19	10 13 43.48	1.215	12 28 27.3	6.63	1.011 4843	28.7	7.54	0.86	0 26.5
	20	10 14 12.65	1.216	12 25 48.0	6.64	1.011 5480	24.4	7.54	0.86	0 23.1
	21	10 14 41.83	+1.216	+12 23 8.5	−6.65	1.011 6015	+ 20.2	7.54	0.86	0 19.6
	22	10 15 11.03	1.217	12 20 28.8	6.66	1.011 6447	15.9	7.54	0.86	0 16.2
	23	10 15 40.23	1.217	12 17 49.0	6.66	1.011 6776	11.6	7.54	0.86	0 12.7
	24	10 16 9.44	1.217	12 15 9.1	6.66	1.011 7003	7.3	7.54	0.86	0 9.3
	25	10 16 38.65	1.217	12 12 29.1	6.67	1.011 7126	+ 3.0	7.54	0 86	0 5.8
	26	10 17 7.86	+1.217	+12 9 49.0	−6.67	1.011 7146	− 1.3	7.54	0.86	0 2.4 23 58.9
	27	10 17 37.05	1.216	12 7 8.9	6.67	1.011 7063	5.6	7.54	0.86	23 55.5
	28	10 18 6.23	1.216	12 4 28.7	6.67	1.011 6877	9.9	7.54	0.86	23 52.0
	29	10 18 35.40	1.215	12 1 48.6	6.67	1.011 6587	14.2	7.54	0.86	23 48.6
	30	10 19 4.54	1.214	11 59 8.5	6.67	1.011 6194	18.5	7.54	0.86	23 45.1
	31	10 19 33.66	+1.213	+11 56 28.5	−6.67	1.011 5697	− 22.8	7.54	0.86	23 41.7
Sept.	1	10 20 2.75	1.212	11 53 48.5	6.66	1.011 5098	27.1	7.54	0.86	23 38.2
	2	10 20 31.81	1.210	11 51 8.7	6.66	1.011 4396	31.4	7.55	0.86	23 34.8
	3	10 21 0.82	1.208	11 48 28.9	6.65	1.011 3592	35.6	7.55	0.86	23 31.3
	4	10 21 29.79	1.206	11 45 49.4	6.64	1.011 2685	39.9	7.55	0.86	23 27.9
	5	10 21 58.72	+1.204	+11 43 10.0	−6.64	1.011 1676	− 44.2	7.55	0.86	23 24.4
	6	10 22 27.59	1.202	11 40 30.8	6.63	1.011 0565	48.4	7.55	0.86	23 21.0
	7	10 22 56.41	1.200	11 37 51.9	6.62	1.010 9353	52.6	7.55	0.86	23 17.5
	8	10 23 25.18	1.197	11 35 13.2	6.61	1.010 8038	56.9	7.56	0.86	23 14.1
	9	10 23 53.88	1.195	11 32 34.8	6.60	1.010 6622	61.1	7.56	0.86	23 10.6
	10	10 24 22.53	+1.192	+11 29 56 6	−6.58	1.010 5104	− 65.4	7.56	0.86	23 7.1
	11	10 24 51.10	1.189	11 27 18.8	6.57	1.010 3485	69.6	7.57	0.86	23 3.7
	12	10 25 19.60	1.186	11 24 41.4	6.55	1.010 1765	73.8	7.57	0.86	23 0.2
	13	10 25 48.02	1.183	11 22 4.3	6.54	1.009 9944	78.0	7.57	0.86	22 56.7
	14	10 26 16.37	1.179	11 19 27.6	6.52	1.009 8021	82.2	7.57	0.86	22 53.3
	15	10 26 44.63	+1.176	+11 16 51.3	−6.50	1.009 5998	− 86.4	7.58	0.86	22 49.8
	16	10 27 12.81	1.172	11 14 15.5	6.48	1.009 3873	90.7	7.58	0.86	22 46.4
	17	10 27 40.90	1.169	11 11 40.1	6.46	1.009 1647	94.8	7.58	0.86	22 42.9
	18	10 28 8.90	1.164	11 9 5.2	6.44	1.008 9321	99.0	7.59	0.86	22 39.4
	19	10 28 36.79	1.160	11 6 30.8	6.42	1.008 6894	103.2	7.59	0.86	22 36.0
	20	10 29 4.58	+1.156	+11 3 57.0	−6.40	1.008 4366	−107.4	7.60	0.86	22 32.5
	21	10 29 32.26	1.151	11 1 23.8	6.37	1.008 1738	111.6	7.60	0.86	22 29.0
	22	10 29 59.83	1.146	10 58 51.2	6.35	1.007 9010	115.8	7.61	0.86	22 25.5
	23	10 30 27.28	1.141	10 56 19.2	6.32	1.007 6182	119.9	7.61	0.87	22 22.1
	24	10 30 54.60	1.136	10 53 48.0	6.29	1.007 3255	124.0	7.62	0.87	22 18.6
	25	10 31 21.80	+1.131	+10 51 17.4	−6.26	1.007 0228	−128.2	7.62	0.87	22 15.1
	26	10 31 48.87	1.125	10 48 47.6	6.23	1.006 7103	132.3	7.63	0.87	22 11.6
	27	10 32 15.81	1.119	10 46 18.5	6.20	1.006 3879	136.4	7.63	0.87	22 8.1
	28	10 32 42.60	1.113	10 43 50.2	6.16	1.006 0557	140.4	7.64	0.87	22 4.6
	29	10 33 9.25	1.108	10 41 22.7	6.13	1.005 7138	144.5	7.65	0.87	22 1.1
	30	10 33 35.76	+1.101	+10 38 56.1	−6.09	1.005 3622	−148.5	7.65	0.87	21 57.6
Oct.	1	10 34 2.11	+1.096	+10 36 30.3	−6.06	1.005 0011	−152.5	7.66	0.87	21 54.1

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
		Noon..	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
		h m s	s	° ′ ″	″			″	″	h m
Oct.	1	10 34 2.11	+1.095	+10 36 30.3	−6.05	1.005 0011	−152.5	7.66	0.87	21 54.1
	2	10 34 28.31	1.088	10 34 5.5	6.01	1.004 6304	156.4	7.67	0.87	21 50.6
	3	10 34 54.34	1.081	10 31 41.6	5.98	1.004 2502	160.4	7.67	0.87	21 47.1
	4	10 35 20.21	1.074	10 29 18.6	5.94	1.003 8607	164.3	7.68	0.87	21 43.6
	5	10 35 45.91	1.067	10 26 56.6	5.90	1.003 4618	168.2	7.68	0.87	21 40.1
	6	10 36 11.44	+1.060	+10 24 35.6	−5.85	1.003 0536	−172.0	7.69	0.87	21 36.6
	7	10 36 36.79	1.053	10 22 15.6	5.81	1.002 6361	175.9	7.70	0.88	21 33.1
	8	10 37 1.97	1.045	10 19 56.7	5.77	1.002 2095	179.7	7.71	0.88	21 29.6
	9	10 37 26.96	1.037	10 17 38.8	5.72	1.001 7737	183.5	7.71	0.88	21 26.1
	10	10 37 51.76	1.030	10 15 22.1	5.67	1.001 3289	187.2	7.72	0.88	21 22.5
	11	10 38 16.38	+1.022	+10 13 6.5	−5.63	1.000 8750	−191.0	7.73	0.88	21 19.0
	12	10 38 40.80	1.013	10 10 52.0	5.58	1.000 4121	194.7	7.74	0.88	21 15.5
	13	10 39 5.02	1.005	10 8 38.7	5.53	0.999 9404	198.4	7.75	0.88	21 12.0
	14	10 39 29.03	0.996	10 6 26.7	5.47	0.999 4598	202.1	7.76	0.88	21 8.4
	15	10 39 52.84	0.988	10 4 15.9	5.43	0.998 9704	205.7	7.76	0.88	21 4.9
	16	10 40 16.44	+0.979	+10 2 6.3	−5.37	0.998 4723	−209.4	7.77	0.88	21 1.3
	17	10 40 39.83	0.970	9 59 58.1	5.31	0.997 9655	213.0	7.78	0.88	20 57.8
	18	10 41 2.99	0.960	9 57 51.2	5.26	0.997 4501	216.5	7.79	0.89	20 54.2
	19	10 41 25.93	0.951	9 55 45.7	5.20	0.996 9261	220.1	7.80	0.89	20 50.7
	20	10 41 48.64	0.941	9 53 41.5	5.14	0.996 3936	223.6	7.81	0.89	20 47.1
	21	10 42 11.11	+0.931	+ 9 51 38.8	−5.08	0.995 8527	−227.1	7.82	0.89	20 43.6
	22	10 42 33.35	0.921	9 49 37.6	5.02	0.995 3036	230.5	7.83	0.89	20 40.0
	23	10 42 55.34	0.911	9 47 37.9	4.96	0.994 7463	233.9	7.84	0.89	20 36.4
	24	10 43 17.09	0.901	9 45 39.7	4.89	0.994 1810	237.2	7.85	0.89	20 32.9
	25	10 43 38.58	0.890	9 43 43.0	4.83	0.993 6077	240.5	7.86	0.89	20 29.3
	26	10 43 59.82	+0.880	+ 9 41 47.9	−4.76	0.993 0266	−243.8	7.87	0.89	20 25.7
	27	10 44 20.80	0.869	9 39 54.4	4.70	0.992 4377	247.0	7.88	0.90	20 22.1
	28	10 44 41.51	0.857	9 38 2.5	4.63	0.991 8412	250.1	7.89	0.90	20 18.5
	29	10 45 1.95	0.846	9 36 12.3	4.56	0.991 2372	253.2	7.91	0.90	20 14.9
	30	10 45 22.11	0.834	9 34 23.8	4.49	0.990 6258	256.3	7.92	0.90	20 11.3
	31	10 45 42.00	+0.823	+ 9 32 37.0	−4.42	0.990 0072	−259.3	7.93	0.90	20 7.7
Nov.	1	10 46 1.61	0.811	9 30 51.9	4.34	0.989 3814	262.2	7.94	0.90	20 4.1
	2	10 46 20.93	0.799	9 29 8.6	4.27	0.988 7486	265.1	7.95	0.90	20 0.5
	3	10 46 39.97	0.787	9 27 27.1	4.19	0.988 1090	267.9	7.96	0.90	19 56.9
	4	10 46 58.71	0.775	9 25 47.4	4.12	0.987 4627	270.7	7.97	0.91	19 53.2
	5	10 47 17.16	+0.763	+ 9 24 9.5	−4.04	0.986 8097	−273.5	7.99	0.91	19 49.6
	6	10 47 35.31	0.750	9 22 33.5	3.96	0.986 1502	276.1	8.00	0.91	19 46.0
	7	10 47 53.16	0.738	9 20 59.4	3.88	0.985 4844	278.7	8.01	0.91	19 42.4
	8	10 48 10.71	0.725	9 19 27.1	3.80	0.984 8124	281.3	8.02	0.91	19 38.7
	9	10 48 27.94	0.712	9 17 56.8	3.72	0.984 1342	283.8	8.04	0.91	19 35.0
	10	10 48 44.87	+0.699	+ 9 16 28.4	−3.64	0.983 4500	−286.3	8.05	0.91	19 31.4
	11	10 49 1.47	0.685	9 15 2.0	3.56	0.982 7600	288.7	8.06	0.92	19 27.7
	12	10 49 17.76	0.672	9 13 37.6	3.48	0.982 0642	291.1	8.07	0.92	19 24.1
	13	10 49 33.72	0.658	9 12 15.2	3.39	0.981 3628	293.4	8.09	0.92	19 20.4
	14	10 49 49.35	0.644	9 10 55.0	3.30	0.980 6559	295.7	8.10	0.92	19 16.7
	15	10 50 4.64	+0.630	+ 9 9 36.8	−3.21	0.979 9437	−297.8	8.11	0.92	19 13.0
	16	10 50 19.60	+0.616	+ 9 8 20.8	−3.12	0.979 2264	−300.0	8.13	0.92	19 9.3

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Nov. 16	10 50 19.60	+0.616	+9 8 20.8	−3.12	0.979 2264	−300.0	8.13	0.92	19 9.3
17	10 50 34.22	0.602	9 7 6.9	3.04	0.978 5040	302.0	8.14	0.93	19 5.6
18	10 50 48.50	0.588	9 5 55.1	2.95	0.977 7769	303.9	8.15	0.93	19 1.9
19	10 51 2.42	0.573	9 4 45.5	2.85	0.977 0451	305.8	8.17	0.93	18 58.2
20	10 51 15.99	0.558	9 3 38.1	2.76	0.976 3089	307.7	8.18	0.93	18 54.5
21	10 51 29.21	+0.543	+9 2 32.9	−2.67	0.975 5684	−309.4	8.19	0.93	18 50.8
22	10 51 42.07	0.528	9 1 30.0	2.57	0.974 8238	311.1	8.21	0.93	18 47.1
23	10 51 54.56	0.513	9 0 29.4	2.48	0.974 0753	312.7	8.22	0.93	18 43.4
24	10 52 6.69	0.498	8 59 31.1	2.38	0.973 3231	314.2	8.24	0.94	18 39.6
25	10 52 18.44	0.482	8 58 35.1	2.29	0.972 5674	315.6	8.25	0.94	18 35.9
26	10 52 29.82	+0.466	+8 57 41.4	−2.19	0.971 8084	−316.9	8.27	0.94	18 32.1
27	10 52 40.83	0.451	8 56 50.1	2.09	0.971 0463	318.1	8.28	0.94	18 28.4
28	10 52 51.46	0.435	8 56 1.1	1.99	0.970 2815	319.2	8.30	0.94	18 24.6
29	10 53 1.71	0.419	8 55 14.6	1.89	0.969 5140	320.3	8.31	0.94	18 20.9
30	10 53 11.58	0.403	8 54 30.4	1.79	0.968 7441	321.3	8.33	0.95	18 17.1
Dec. 1	10 53 21.06	+0.387	+8 53 48.6	−1.69	0.967 9720	−322.1	8.34	0.95	18 13.3
2	10 53 30.15	0.371	8 53 9.2	1.59	0.967 1979	322.9	8.35	0.95	18 9.5
3	10 53 38.85	0.354	8 52 32.2	1.49	0.966 4220	323.6	8.37	0.95	18 5.7
4	10 53 47.16	0.338	8 51 57.7	1.38	0.965 6445	324.2	8.39	0.95	18 1.9
5	10 53 55.08	0.322	8 51 25.7	1.28	0.964 8657	324.8	8.40	0.95	17 58.1
6	10 54 2.60	+0.305	+8 50 56.1	−1.18	0.964 0857	−325.2	8.41	0.96	17 54.3
7	10 54 9.73	0.289	8 50 29.0	1.08	0.963 3048	325.6	8.43	0.96	17 50.5
8	10 54 16.45	0.272	8 50 4.3	0.98	0.962 5231	325.8	8.45	0.96	17 46.7
9	10 54 22.78	0.255	8 49 42.2	0.87	0.961 7410	326.0	8.46	0.96	17 42.8
10	10 54 28.70	0.238	8 49 22.6	0.77	0.960 9585	326.1	8.47	0.96	17 39.0
11	10 54 34.22	+0.221	+8 49 5.4	−0.66	0.960 1760	−326.0	8.49	0.97	17 35.1
12	10 54 39.33	0.205	8 48 50.8	0.55	0.959 3937	325.9	8.51	0.97	17 31.3
13	10 54 44.04	0.188	8 48 38.8	0.45	0.958 6117	325.7	8.52	0.97	17 27.4
14	10 54 48.33	0.170	8 48 29.3	0.34	0.957 8303	325.4	8.54	0.97	17 23.6
15	10 54 52.21	0.153	8 48 22.4	0.24	0.957 0499	325.0	8.55	0.97	17 19.7
16	10 54 55.68	+0.136	+8 48 18.0	−0.13	0.956 2706	−324.4	8.57	0.97	17 15.8
17	10 54 58.73	0.118	8 48 16.1	−0.03	0.955 4927	323.8	8.58	0.98	17 11.9
18	10 55 1.36	0.101	8 48 16.8	+0.08	0.954 7165	323.0	8.60	0.98	17 8.0
19	10 55 3.58	0.084	8 48 20.1	0.19	0.953 9423	322.1	8.61	0.98	17 4.1
20	10 55 5.37	0.066	8 48 26.0	0.30	0.953 1703	321.2	8.63	0.98	17 0.2
21	10 55 6.75	+0.049	+8 48 34.4	+0.40	0.952 4008	−320.1	8.64	0.98	16 56.3
22	10 55 7.71	0.032	8 48 45.4	0.51	0.951 6341	318.9	8.66	0.98	16 52.4
23	10 55 8.25	+0.014	8 48 58.9	0.62	0.950 8704	317.5	8.67	0.99	16 48.5
24	10 55 8.36	−0.004	8 49 15.0	0.72	0.950 1101	316.0	8.69	0.99	16 44.5
25	10 55 8.06	0.021	8 49 33.6	0.83	0.949 3535	314.4	8.70	0.99	16 40.6
26	10 55 7.34	−0.039	+8 49 54.8	+0.94	0.948 6009	−312.7	8.72	0.99	16 36.6
27	10 55 6.21	0.056	8 50 18.5	1.04	0.947 8525	310.9	8.73	0.99	16 32.7
28	10 55 4.67	0.073	8 50 44.6	1.14	0.947 1086	309.0	8.75	0.99	16 28.7
29	10 55 2.71	0.090	8 51 13.3	1.25	0.946 3694	307.0	8.76	1.00	16 24.8
30	10 55 0.34	0.108	8 51 44.5	1.35	0.945 6353	304.8	8.78	1.00	16 20.8
31	10 54 57.55	−0.125	+8 52 18.1	+1.45	0.944 9064	−302.5	8.79	1.00	16 16.8
32	10 54 54.36	−0.142	+8 52 54.1	+1.55	0.944 1832	−300.1	8.81	1.00	16 12.8

SATURN, 1919.

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ′ ″	′ ″	′ ″	° ′ ″	″		
Jan. 7	143 27 24.6	2 9.54	+1 25.4	+1 15 45.8	+4.85	0.963 9434	+116.7
15	143 44 40.7	2 9.49	1 25.8	1 16 24.5	4.83	0.964 0369	117.1
23	144 1 56.4	2 9.43	1 26.3	1 17 3.0	4.81	0.964 1307	117.5
31	144 19 11.6	2 9.37	1 26.7	1 17 41.5	4.80	0.964 2249	117.9
Feb. 8	144 36 26.4	2 9.33	1 27.2	1 18 19.8	4.78	0.964 3194	118.4
16	144 53 40.8	2 9.27	+1 27.6	+1 18 58.0	+4.76	0.964 4143	+118.8
24	145 10 54.7	2 9.21	1 28.0	1 19 36.0	4.74	0.964 5094	119.1
Mar. 4	145 28 8.2	2 9.16	1 28.4	1 20 13.9	4.73	0.964 6049	119.6
12	145 45 21.3	2 9.11	1 28.9	1 20 51.7	4.71	0.964 7007	119.9
20	146 2 33.9	2 9.05	1 29.3	1 21 29.3	4.69	0.964 7967	120.2
28	146 19 46.1	2 8.99	+1 29.6	+1 22 6.8	+4.68	0.964 8931	+120.6
Apr. 5	146 36 57.8	2 8.94	1 30.0	1 22 44.1	4.66	0.964 9897	121.0
13	146 54 9.1	2 8.89	1 30.4	1 23 21.4	4.65	0.965 0867	121.4
21	147 11 20.0	2 8.83	1 30.8	1 23 58.5	4.63	0.965 1839	121.8
29	147 28 30.4	2 8.78	1 31.1	1 24 35.4	4.61	0.965 2815	122.1
May 7	147 45 40.4	2 8.71	+1 31.4	+1 25 12.2	+4.59	0.965 3793	+122.5
15	148 2 49.8	2 8.66	1 31.8	1 25 48.8	4.57	0.965 4775	122.9
23	148 19 58.9	2 8.61	1 32.1	1 26 25.3	4.56	0.965 5759	123.2
31	148 37 7.5	2 8.54	1 32.4	1 27 1.7	4.54	0.965 6746	123.6
June 8	148 54 15.6	2 8.49	1 32.7	1 27 37.9	4.52	0.965 7736	123.9
16	149 11 23.3	2 8.43	+1 33.0	+1 28 14.0	+4.50	0.965 8729	+124.4
24	149 28 30.5	2 8.37	1 33.3	1 28 49.9	4.48	0.965 9726	124.8
July 2	149 45 37.2	2 8.31	1 33.6	1 29 25.6	4.46	0.966 0725	125.0
10	150 2 43.5	2 8.26	1 33.9	1 30 1.2	4.44	0.966 1726	125.3
18	150 19 49.3	2 8.19	1 34.1	1 30 36.7	4.42	0.966 2730	125.6
26	150 36 54.6	2 8.14	+1 34.4	+1 31 12.0	+4.41	0.966 3736	+125.9
Aug. 3	150 53 59.5	2 8.08	1 34.6	1 31 47.2	4.39	0.966 4745	126.2
11	151 11 3.9	2 8.02	1 34.8	1 32 22.2	4.37	0.966 5756	126.5
19	151 28 7.8	2 7.96	1 35.1	1 32 57.1	4.35	0.966 6769	126.8
27	151 45 11.3	2 7.91	1 35.3	1 33 31.8	4.33	0.966 7785	127.2
Sept. 4	152 2 14.3	2 7.84	+1 35.5	+1 34 6.4	+4.31	0.966 8804	+127.5
12	152 19 16.8	2 7.79	1 35.7	1 34 40.8	4.29	0.966 9825	127.8
20	152 36 18.9	2 7.73	1 35.9	1 35 15.0	4.27	0.967 0849	128.2
28	152 53 20.5	2 7.67	1 36.0	1 35 49.1	4.25	0.967 1876	128.5
Oct. 6	153 10 21.6	2 7.61	1 36.2	1 36 23.0	4.23	0.967 2905	128.8
14	153 27 22.3	2 7.56	+1 36.4	+1 36 56.8	+4.21	0.967 3937	+129.1
22	153 44 22.5	2 7.49	1 36.5	1 37 30.4	4.19	0.967 4971	129.4
30	154 1 22.2	2 7.43	1 36.6	1 38 3.9	4.17	0.967 6007	129.6
Nov. 7	154 18 21.4	2 7.38	1 36.8	1 38 37.2	4.15	0.967 7045	129.9
15	154 35 20.2	2 7.32	1 36.9	1 39 10.3	4.13	0.967 8085	130.1
23	154 52 18.5	2 7.26	+1 37.0	+1 39 43.3	+4.11	0.967 9127	+130.4
Dec. 1	155 9 16.3	2 7.19	1 37.1	1 40 16.1	4.09	0.968 0171	130.6
9	155 26 13.6	2 7.13	1 37.2	1 40 48.8	4.07	0.968 1217	130.9
17	155 43 10.4	2 7.08	1 37.3	1 41 21.3	4.05	0.968 2265	131.1
25	156 0 6.8	2 7.02	1 37.3	1 41 53.6	4.03	0.968 3315	131.4
33	156 17 2.7	2 6.96	+1 37.4	+1 42 25.8	+4.01	0.968 4367	+131.6
41	**156 33 58.1**	**2 6.89**	**+1 37.4**	**+1 42 57.8**	**+3.99**	**0.968 5421**	**+131.9**

URANUS, 1919.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Day.	Apparent Declination.	Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
Jan. 1	21 50 51.37	+10.337	−13 48 19.5	+55.27	1.315 9455	+2588.5	1.62	0.43	3 10.0
5	21 51 33.72	10.828	13 44 33.2	57.84	1.316 9444	2404.8	1.62	0.42	2 55.0
9	21 52 17.93	11.272	13 40 37.1	60.19	1.317 8681	2212.1	1.61	0.42	2 40.0
13	21 53 3.84	11.674	13 36 32.0	62.32	1.318 7131	2012.0	1.61	0.42	2 25.0
17	21 53 51.27	12.036	13 32 18.8	64.26	1.319 4769	1806.9	1.61	0.42	2 10.1
21	21 54 40.07	+12.355	−13 27 58.2	+66.00	1.320 1570	+1593.4	1.60	0.42	1 55.2
25	21 55 30.06	12.634	13 23 31.1	67.51	1.320 7508	1374.8	1.60	0.42	1 40.3
29	21 56 21.09	12.872	13 18 58.4	68.80	1.321 2561	1150.9	1.60	0.42	1 25.4
Feb. 2	21 57 12.97	13.058	13 14 21.0	69.85	1.321 6709	922.0	1.60	0.42	1 10.5
6	21 58 5.49	13.195	13 9 39.9	70.65	1.321 9933	690.3	1.60	0.42	0 55.7
10	21 58 58.47	+13.287	−13 4 56.1	+71.20	1.322 2230	+ 458.0	1.60	0.42	0 40.8
14	21 59 51.73	13.336	13 0 10.6	71.51	1.322 3597	+ 225.7	1.60	0.42	0 26.0
18	22 0 45.10	13.341	12 55 24.3	71.60	1.322 4036	− 6.4	1.60	0.42	0 11.1
22	22 1 38.40	13.304	12 50 38.1	71.47	1.322 3546	238.7	1.60	0.42	23 52.6
26	22 2 31.47	13.223	12 45 52.9	71.10	1.322 2127	470.5	1.60	0.42	23 37.7
Mar. 2	22 3 24.12	+13.095	−12 41 9.7	+70.44	1.321 9784	− 701.0	1.60	0.42	23 22.9
6	22 4 16.17	12.922	12 36 29.7	69.54	1.321 6524	927.7	1.60	0.42	23 8.0
10	22 5 7.44	12.706	12 31 53.7	68.41	1.321 2369	1149.0	1.60	0.42	22 53.1
14	22 5 57.76	12.448	12 27 22.7	67.05	1.320 7339	1365.2	1.60	0.42	22 38.2
18	22 6 46.97	12.152	12 22 57.6	65.47	1.320 1455	1575.6	1.60	0.42	22 23.3
22	22 7 34.93	+11.821	−12 18 39.2	+63.69	1.319 4742	−1779.8	1.61	0.42	22 8.4
26	22 8 21.49	11.452	12 14 28.4	61.68	1.318 7224	1978.6	1.61	0.42	21 53.4
30	22 9 6.49	11.043	12 10 26.1	59.43	1.317 8923	2170.0	1.61	0.42	21 38.4
Apr. 3	22 9 49.78	10.593	12 6 33.3	56.95	1.316 9876	2352.2	1.62	0.42	21 23.4
7	22 10 31.19	10.109	12 2 50.8	54.27	1.316 0119	2524.1	1.62	0.43	21 8.4
11	22 11 10.61	+ 9.596	−11 59 19.4	+51.43	1.314 9697	−2685.4	1.62	0.43	20 53.3
15	22 11 47.92	9.053	11 55 59.6	48.42	1.313 8650	2835.9	1.63	0.43	20 38.2
19	22 12 23.00	8.483	11 52 52.3	45.21	1.312 7024	2975.8	1.63	0.43	20 23.0
23	22 12 55.75	7.886	11 49 58.1	41.86	1.311 4858	3105.5	1.64	0.43	20 7.8
27	22 13 26.05	7.261	11 47 17.6	38.37	1.310 2195	3223.0	1.64	0.43	19 52.6
May 1	22 13 53.80	+ 6.607	−11 44 51.4	+34.70	1.308 9093	−3325.9	1.65	0.43	19 37.3
5	22 14 18.88	5.934	11 42 40.3	30.84	1.307 5607	3414.1	1.65	0.43	19 22.0
9	22 14 41.25	5.247	11 40 44.7	26.99	1.306 1799	3488.0	1.66	0.43	19 6.6
13	22 15 0.83	4.540	11 39 4.5	23.06	1.304 7722	3547.7	1.66	0.44	18 51.2
17	22 15 17.56	3.826	11 37 40.4	18.98	1.303 3437	3592.5	1.67	0.44	18 35.7
21	22 15 31.42	+ 3.100	−11 36 32.7	+14.88	1.301 9002	−3622.4	1.67	0.44	18 20.2
25	22 15 42.34	2.360	11 35 41.4	10.72	1.300 4478	3637.6	1.68	0.44	18 4.7
29	22 15 50.29	1.613	11 35 7.0	6.50	1.298 9924	3635.4	1.68	0.44	17 49.1
June 2	22 15 55.24	0.864	11 34 49.4	+ 2.29	1.297 5419	3614.8	1.69	0.44	17 33.4
6	22 15 57.21	+ 0.120	11 34 48.6	− 1.87	1.296 1028	3577.6	1.70	0.45	17 17.7
10	22 15 56.21	− 0.618	−11 35 4.3	− 5.98	1.294 6820	−3524.1	1.70	0.45	17 2.0
14	22 15 52.28	1.345	11 35 36.4	10.05	1.293 2857	3454.4	1.71	0.45	16 46.2
18	22 15 45.46	2.063	11 36 24.6	14.04	1.291 9206	3369.0	1.71	0.45	16 30.3
22	22 15 35.79	2.770	11 37 28.6	17.94	1.290 5927	3267.0	1.72	0.45	16 14.4
26	22 15 23.32	3.461	11 38 48.0	21.75	1.289 3093	3147.3	1.72	0.45	15 58.5
30	22 15 8.13	− 4.129	−11 40 22.4	−25.41	1.288 0771	−3010.6	1.73	0.45	15 42.5
July 4	22 14 50.33	− 4.765	−11 42 11.0	−28.86	1.286 9030	−2857.8	1.73	0.45	15 [illegible]

URANUS, 1919.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Day.	Apparent Declination.	Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
July 4	22 14 50.33	−4.765	−11 42 11.0	−28.86	1.286 9030	−2857.6	1.73	0.45	15 26.5
8	22 14 30.06	5.371	11 44 13.0	32.11	1.285 7930	2689.6	1.74	0.46	15 10.4
12	22 14 7.41	5.942	11 46 27.6	35.15	1.284 7531	2508.3	1.74	0.46	14 54.3
16	22 13 42.56	6.479	11 48 53.9	37.97	1.283 7881	2314.2	1.74	0.46	14 38.1
20	22 13 15.63	6.978	11 51 31.1	40.59	1.282 9035	2106.9	1.75	0.46	14 22.0
24	22 12 46.79	−7.435	−11 54 18.3	−42.95	1.282 1043	−1886.5	1.75	0.46	14 5.8
28	22 12 16.21	7.846	11 57 14.3	45.00	1.281 3959	1654.1	1.75	0.46	13 49.5
Aug. 1	22 11 44.09	8.203	12 0 17.9	46.74	1.280 7824	1411.1	1.76	0.46	13 33.3
5	22 11 10.66	8.502	12 3 27.8	48.16	1.280 2681	1159.8	1.76	0.46	13 17.0
9	22 10 36.14	8.750	12 6 42.8	49.29	1.279 8553	903.6	1.76	0.46	13 0.7
13	22 10 0.73	−8.943	−12 10 1.7	−50.09	1.279 5460	− 641.6	1.76	0.46	12 44.3
17	22 9 24.67	9.081	12 13 23.1	50.58	1.279 3427	374.5	1.76	0.46	12 28.0
21	22 8 48.16	9.163	12 16 45.9	50.75	1.279 2469	− 103.8	1.76	0.46	12 11.7
25	22 8 11.45	9.179	12 20 8.6	50.54	1.279 2600	+ 169.5	1.76	0.46	11 55.3
29	22 7 34.81	9.131	12 23 29.8	50.01	1.279 3825	442.6	1.76	0.46	11 39.0
Sept. 2	22 6 58.48	−9.023	−12 26 48.2	−49.12	1.279 6137	+ 712.9	1.76	0.46	11 22.7
6	22 6 22.71	8.852	12 30 2.3	47.90	1.279 9522	978.5	1.76	0.46	11 6.4
10	22 5 47.74	8.626	12 33 11.0	46.41	1.280 3958	1238.9	1.76	0.46	10 50.1
14	22 5 13.78	8.343	12 36 13.2	44.63	1.280 9425	1493.0	1.76	0.46	10 33.8
18	22 4 41.07	8.004	12 39 7.6	42.52	1.281 5893	1740.4	1.75	0.46	10 17.5
22	22 4 9.82	−7.611	−12 41 53.0	−40.13	1.282 3337	+1979.5	1.75	0.46	10 1.3
26	22 3 40.26	7.160	12 44 28.3	37.47	1.283 1715	2207.9	1.75	0.46	9 45.1
30	22 3 12.61	6.657	12 46 52.4	34.54	1.284 0983	2423.2	1.74	0.46	9 28.9
Oct. 4	22 2 47.06	6.111	12 49 4.3	31.40	1.285 1081	2623.7	1.74	0.46	9 12.7
8	22 2 23.78	5.522	12 51 3.3	28.05	1.286 1953	2809.6	1.73	0.46	8 56.6
12	22 2 2.93	−4.901	−12 52 48.5	−24.55	1.287 3539	+2981.6	1.73	0.45	8 40.5
16	22 1 44.62	4.245	12 54 19.5	20.88	1.288 5786	3138.9	1.72	0.45	8 24.5
20	22 1 29.02	3.551	12 55 35.3	17.02	1.289 8628	3279.5	1.72	0.45	8 8.5
24	22 1 16.25	2.829	12 56 35.5	13.04	1.291 1999	3403.3	1.71	0.45	7 52.6
28	22 1 6.42	2.083	12 57 19.5	8.96	1.292 5829	3507.8	1.71	0.45	7 36.7
Nov. 1	22 0 59.61	−1.321	−12 57 47.1	− 4.81	1.294 0036	+3592.8	1.70	0.45	7 20.9
5	22 0 55.87	−0.546	12 57 57.9	− 0.59	1.295 4547	3659.8	1.70	0.45	7 5.1
9	22 0 55.25	+0.234	12 57 51.8	+ 3.64	1.296 9291	3709.2	1.69	0.44	6 49.4
13	22 0 57.75	1.019	12 57 28.8	7.86	1.298 4197	3741.1	1.69	0.44	6 33.7
17	22 1 3.41	1.809	12 56 48.9	12.12	1.299 9196	3755.5	1.68	0.44	6 18.1
21	22 1 12.22	+2.598	−12 55 51.8	+16.40	1.301 4216	+3751.3	1.67	0.44	6 2.5
25	22 1 24.19	3.383	12 54 37.8	20.58	1.302 9181	3727.9	1.67	0.44	5 47.0
29	22 1 39.27	4.154	12 53 7.2	24.73	1.304 4015	3686.2	1.66	0.44	5 31.5
Dec. 3	22 1 57.40	4.907	12 51 20.1	28.77	1.305 8648	3627.4	1.66	0.43	5 16.1
7	22 2 18.50	5.641	12 49 17.2	32.69	1.307 3014	3553.5	1.65	0.43	5 0.7
11	22 2 42.50	+6.354	−12 46 58.7	+36.53	1.308 7056	+3464.9	1.65	0.43	4 45.4
15	22 3 9.30	7.044	12 44 25.1	40.26	1.310 0713	3361.2	1.64	0.43	4 30.1
19	22 3 38.82	7.712	12 41 36.8	43.87	1.311 3926	3242.7	1.64	0.43	4 14.8
23	22 4 10.96	8.351	12 38 34.4	47.30	1.312 6635	3109.4	1.63	0.43	3 59.6
27	22 4 45.58	8.954	12 35 18.6	50.57	1.313 8783	2962.4	1.63	0.43	3 44.5
31	22 5 22.54	+9.520	−12 31 50.1	+53.65	1.315 0318	+2803.0	1.62	0.43	3 29.4

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	″	″	° ′ ″	″		
Jan.	5	327 13 42.2	38.84	+5.0	−0 44 27.9	−0.15	1.301 4170	+14.2
	15	327 20 10.6	38.84	5.0	0 44 29.4	0.15	1.301 4312	14.2
	25	327 26 38.9	38.83	5.0	0 44 30.8	0.15	1.301 4454	14.2
Feb.	4	327 33 7.2	38.83	+5.0	−0 44 32.3	−0.15	1.301 4595	+14.1
	14	327 39 35.5	38.82	4.9	0 44 33.7	0.14	1.301 4736	14.1
	24	327 46 3.7	38.82	4.9	0 44 35.1	0.14	1.301 4877	14.0
Mar.	6	327 52 31.9	38.82	+4.9	−0 44 36.5	−0.14	1.301 5017	+14.0
	16	327 59 0.1	38.82	4.9	0 44 37.9	0.14	1.301 5156	13.9
	26	328 5 28.2	38.81	4.8	0 44 39.3	0.14	1.301 5295	13.8
Apr.	5	328 11 56.3	38.81	+4.8	−0 44 40.7	−0.14	1.301 5433	+13.8
	15	328 18 24.4	38.81	4.8	0 44 42.1	0.14	1.301 5570	13.7
	25	328 24 52.5	38.80	4.7	0 44 43.5	0.14	1.301 5707	13.6
May	5	328 31 20.5	38.80	+4.7	−0 44 44.8	−0.14	1.301 5843	+13.6
	15	328 37 48.5	38.80	4.7	0 44 46.2	0.13	1.301 5979	13.6
	25	328 44 16.4	38.79	4.6	0 44 47.5	0.13	1.301 6114	13.5
June	4	328 50 44.3	38.79	+4.6	−0 44 48.8	−0.13	1.301 6249	+13.5
	14	328 57 12.2	38.79	4.6	0 44 50.1	0.13	1.301 6384	13.4
	24	329 3 40.1	38.78	4.6	0 44 51.4	0.13	1.301 6517	13.3
July	4	329 10 7.9	38.78	+4.5	−0 44 52.7	−0.13	1.301 6649	+13.3
	14	329 16 35.7	38.78	4.5	0 44 54.0	0.13	1.301 6782	13.2
	24	329 23 3.5	38.78	4.5	0 44 55.3	0.13	1.301 6914	13.2
Aug.	3	329 29 31.3	38.78	+4.4	−0 44 56.6	−0.13	1.301 7045	+13.1
	13	329 35 59.0	38.77	4.4	0 44 57.8	0.13	1.301 7175	13.0
	23	329 42 26.7	38.77	4.4	0 44 59.1	0.13	1.301 7305	13.0
Sept.	2	329 48 54.4	38.76	+4.3	−0 45 0.3	−0.12	1.301 7435	+12.9
	12	329 55 22.0	38.76	4.3	0 45 1.6	0.12	1.301 7564	12.8
	22	330 1 49.6	38.76	4.3	0 45 2.8	0.12	1.301 7692	12.8
Oct.	2	330 8 17.2	38.76	+4.2	−0 45 4.0	−0.12	1.301 7820	+12.7
	12	330 14 44.7	38.76	4.2	0 45 5.2	0.12	1.301 7947	12.7
	22	330 21 12.3	38.75	4.2	0 45 6.4	0.12	1.301 8074	12.6
Nov.	1	330 27 39.8	38.75	+4.2	−0 45 7.6	−0.12	1.301 8200	+12.6
	11	330 34 7.3	38.75	4.1	0 45 8.8	0.12	1.301 8326	12.5
	21	330 40 34.7	38.74	4.1	0 45 9.9	0.12	1.301 8451	12.4
Dec.	1	330 47 2.1	38.74	+4.1	−0 45 11.1	−0.12	1.301 8575	+12.4
	11	330 53 29.5	38.74	4.0	0 45 12.2	0.11	1.301 8699	12.4
	21	330 59 56.9	38.74	4.0	0 45 13.4	0.11	1.301 8822	12.3
	31	331 6 24.2	38.73	+4.0	−0 45 14.5	−0.11	1.301 8945	+12.2
	41	331 12 51.5	38.73	+3.9	−0 45 15.6	−0.11	1.301 9067	+12.1

NEPTUNE, 1919.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Day.	Apparent Declination.	Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h m
Jan. 1	8 44 18.49	−5.805	+18 0 12.1	+23.06	1.465 0830	−1236.1	1.32	0.30	14 1.6
5	8 43 54.70	6.086	18 1 46.4	24.09	1.464 6214	1069.8	1.33	0.30	13 45.5
9	8 43 29.86	6.324	18 3 24.6	24.97	1.464 2280	897.0	1.33	0.30	13 29.3
13	8 43 4.17	6.514	18 5 5.9	25.65	1.463 9042	721.6	1.33	0.30	13 13.2
17	8 42 37.80	6.667	18 6 49.6	26.17	1.463 6512	542.5	1.33	0.30	12 57.0
21	8 42 10.89	−6.778	+18 8 35.1	+26.57	1.463 4707	− 359.1	1.33	0.30	12 40.9
25	8 41 43.63	6.846	18 10 21.9	26.78	1.463 3642	− 173.4	1.33	0.30	12 24.7
29	8 41 16.18	6.869	18 12 9.1	26.82	1.463 3321	+ 12.8	1.33	0.30	12 8.5
Feb. 2	8 40 48.74	6.844	18 13 56.2	26.67	1.463 3745	199.8	1.33	0.30	11 52.3
6	8 40 21.49	6.772	18 15 42.2	26.31	1.463 4917	384.6	1.33	0.30	11 36.1
10	8 39 54.62	−6.657	+18 17 26.5	+25.82	1.463 6817	+ 565.7	1.33	0.30	11 19.9
14	8 39 28.29	6.498	18 19 8.6	25.19	1.463 9438	743.9	1.33	0.30	11 3.8
18	8 39 2.69	6.299	18 20 47.8	24.40	1.464 2761	916.4	1.33	0.30	10 47.6
22	8 38 37.95	6.065	18 22 23.6	23.47	1.464 6762	1083.4	1.33	0.30	10 31.5
26	8 38 14.23	5.786	18 23 55.4	22.40	1.465 1421	1245.5	1.32	0.30	10 15.4
Mar. 2	8 37 51.71	−5.471	+18 25 22.6	+21.18	1.465 6716	+1399.9	1.32	0.30	9 59.3
6	8 37 30.51	5.121	18 26 44.7	19.83	1.466 2608	1545.0	1.32	0.30	9 43.2
10	8 37 10.79	4.736	18 28 1.1	18.38	1.466 9064	1681.2	1.32	0.30	9 27.1
14	8 36 52.66	4.325	18 29 11.6	16.84	1.467 6044	1806.8	1.32	0.30	9 11.1
18	8 36 36.22	3.892	18 30 15.7	15.20	1.468 3505	1922.4	1.31	0.30	8 55.1
22	8 36 21.56	−3.432	+18 31 13.1	+13.50	1.469 1410	+2028.2	1.31	0.30	8 39.1
26	8 36 8.79	2.952	18 32 3.6	11.72	1.469 9716	2123.1	1.31	0.30	8 23.2
30	8 35 57.97	2.453	18 32 46.8	9.87	1.470 8380	2206.8	1.31	0.30	8 7.3
Apr. 3	8 35 49.19	1.936	18 33 22.5	7.96	1.471 7355	2278.9	1.30	0.30	7 51.4
7	8 35 42.50	1.407	18 33 50.4	5.99	1.472 6594	2337.7	1.30	0.30	7 35.6
11	8 35 37.94	−0.873	+18 34 10.4	+ 4.04	1.473 6041	+2385.0	1.30	0.30	7 19.8
15	8 35 35.52	−0.334	18 34 22.7	2.08	1.474 5659	2421.1	1.30	0.29	7 4.1
19	8 35 35.27	+0.207	18 34 27.0	+ 0.08	1.475 5394	2444.7	1.29	0.29	6 48.3
23	8 35 37.18	0.750	18 34 23.3	− 1.93	1.476 5203	2458.4	1.29	0.29	6 32.6
27	8 35 41.27	1.294	18 34 11.6	3.93	1.477 5046	2460.7	1.29	0.29	6 17.0
May 1	8 35 47.53	+1.835	+18 33 51.9	− 5.92	1.478 4872	+2450.4	1.28	0.29	6 1.4
5	8 35 55.94	2.368	18 33 24.3	7.88	1.479 4634	2428.7	1.28	0.29	5 45.8
9	8 36 6.46	2.890	18 32 48.9	9.82	1.480 4287	2396.0	1 28	0.29	5 30.2
13	8 36 19.04	3.399	18 32 5.8	11.72	1.481 3789	2353.5	1.28	0.29	5 14.7
17	8 36 33.63	3.894	18 31 15.2	13.57	1.482 3103	2301.9	1.27	0.29	4 59.2
21	8 36 50.17	+4.373	+18 30 17.3	−15.37	1.483 2192	+2240.9	1.27	0.29	4 43.8
25	8 37 8.60	4.842	18 29 12.3	17.13	1.484 1018	2170.6	1.27	0.29	4 28.3
29	8 37 28.88	5.293	18 28 0.3	18.86	1.484 9545	2091.4	1.27	0.29	4 12.9
June 2	8 37 50.91	5.719	18 26 41.5	20.50	1.485 7737	2002.7	1.26	0.29	3 57.6
6	8 38 14.60	6.124	18 25 16.4	22.05	1.486 5556	1905.8	1.26	0.29	3 42.3
10	8 38 39.87	+6.507	+18 23 45.2	−23.54	1.487 2975	+1802.6	1.26	0.29	3 27.0
14	8 39 6.62	6.863	18 22 8.2	24.96	1.487 9969	1693.4	1.26	0.29	3 11.7
18	8 39 34.74	7.195	18 20 25.6	26.30	1.488 6514	1577.9	1.25	0.29	2 56.4
22	8 40 4.15	7.507	18 18 37.9	27.55	1.489 2584	1456.5	1.25	0.29	2 41.2
26	8 40 34.76	7.792	18 16 45.3	28.73	1.489 8157	1328.2	1.25	0.28	2 25.9
30	8 41 6.45	+8.049	+18 14 48.2	−29.79	1.490 3203	+1195.2	1.25	0.28	2 10.7
July 4	8 41 39.11	+8.275	+18 12 47.1	−30.74	1.490 7713	+1058.3	1.25	0.28	1 55.6

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Day.	Apparent Declination.	Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″			″	″	h m
July 4	8 41 39.11	+8.275	+18 12 47.1	−30.74	1.490 7713	+1058.3	1.25	0.28	1 55.6
8	8 42 12.61	8.469	18 10 42.4	31.60	1.491 1664	917.1	1.25	0.28	1 40.4
12	8 42 46.83	8.638	18 8 34.4	32.37	1.491 5046	773.4	1.25	0.28	1 25.2
16	8 43 21.68	8.778	18 6 23.6	33.02	1.491 7848	627.2	1.25	0.28	1 10.1
20	8 43 57.02	8.890	18 4 10.4	33.58	1.492 0060	478.3	1.25	0.28	0 54.9
24	8 44 32.76	+8.974	+18 1 55.1	−34.03	1.492 1671	+ 327.1	1.24	0.28	0 39.8
28	8 45 8.77	9.026	17 59 38.3	34.35	1.492 2674	173.8	1.24	0.28	0 24.7
Aug. 1	8 45 44.92	9.043	17 57 20.5	34.53	1.492 3060	+ 19.7	1.24	0.28	0 9.5
5	8 46 21.07	9.028	17 55 2.2	34.60	1.492 2832	− 134.0	1.24	0.28	23 50.6
9	8 46 57.11	8.986	17 52 43.8	34.58	1.492 1989	287.0	1.24	0.28	23 35.5
13	8 47 32.92	+8.915	+17 50 25.7	−34.42	1.492 0538	− 438.4	1.24	0.28	23 20.3
17	8 48 8.39	8.814	17 48 8.6	34.13	1.491 8483	589.3	1.25	0.28	23 5.2
21	8 48 43.39	8.683	17 45 52.8	33.75	1.491 5825	739.2	1.25	0.28	22 50.0
25	8 49 17.81	8.520	17 43 38.8	33.22	1.491 2572	887.0	1.25	0.28	22 34.9
29	8 49 51.51	8.326	17 41 27.2	32.54	1.490 8733	1032.0	1.25	0.28	22 19.7
Sept. 2	8 50 24.38	+8.102	+17 39 18.6	−31.76	1.490 4322	−1172.5	1.25	0.28	22 4.6
6	8 50 56.29	7.849	17 37 13.3	30.84	1.489 9359	1308.2	1.25	0.28	21 49.4
10	8 51 27.14	7.570	17 35 12.0	29.82	1.489 3862	1439.7	1.25	0.29	21 34.1
14	8 51 56.82	7.267	17 33 14.9	28.70	1.488 7848	1566.3	1.25	0.29	21 18.9
18	8 52 25.24	6.937	17 31 22.6	27.43	1.488 1339	1687.2	1.26	0.29	21 3.6
22	8 52 52.28	+6.578	+17 29 35.6	−26.04	1.487 4358	−1802.5	1.26	0.29	20 48.3
26	8 53 17.83	6.191	17 27 54.4	24.54	1.486 6928	1911.1	1.26	0.29	20 33.0
30	8 53 41.78	5.781	17 26 19.4	22.93	1.485 9080	2011.2	1.26	0.29	20 17.7
Oct. 4	8 54 4.05	5.351	17 24 51.1	21.21	1.485 0850	2102.8	1.27	0.29	20 2.3
8	8 54 24.56	4.900	17 23 29.8	19.43	1.484 2269	2185.6	1.27	0.29	19 46.9
12	8 54 43.23	+4.433	+17 22 15.8	−17.55	1.483 3377	−2259.4	1.27	0.29	19 31.5
16	8 55 0.00	3.947	17 21 9.5	15.59	1.482 4205	2325.3	1.27	0.29	19 16.1
20	8 55 14.78	3.443	17 20 11.2	13.53	1.481 4788	2380.8	1.28	0.29	19 0.6
24	8 55 27.52	2.923	17 19 21.3	11.42	1.480 5173	2425.6	1.28	0.29	18 45.1
28	8 55 38.15	2.391	17 18 39.9	9.25	1.479 5399	2458.6	1.28	0.29	18 29.5
Nov. 1	8 55 46.64	+1.851	+17 18 7.4	− 7.01	1.478 5520	−2479.4	1.28	0.29	18 13.9
5	8 55 52.95	1.305	17 17 43.8	4.77	1.477 5579	2489.0	1.29	0.29	17 58.3
9	8 55 57.08	0.760	17 17 29.2	2.54	1.476 5623	2487.2	1.29	0.29	17 42.6
13	8 55 59.02	+0.208	17 17 23.5	− 0.26	1.475 5697	2474.0	1.29	0.29	17 26.9
17	8 55 58.74	−0.346	17 17 27.1	+ 2.03	1.474 5848	2448.1	1.30	0.29	17 11.2
21	8 55 56.26	−0.895	+17 17 39.7	+ 4.29	1.473 6129	−2409.6	1.30	0.30	16 55.4
25	8 55 51.59	1.438	17 18 1.4	6.53	1.472 6588	2358.5	1.30	0.30	16 39.6
29	8 55 44.77	1.972	17 18 32.0	8.74	1.471 7279	2293.2	1.30	0.30	16 23.7
Dec. 3	8 55 35.84	2.487	17 19 11.2	10.83	1.470 8258	2216.2	1.31	0.30	16 7.8
7	8 55 24.90	2.982	17 19 58.6	12.87	1.469 9564	2128.3	1.31	0.30	15 51.9
11	8 55 12.00	−3.466	+17 20 54.1	+14.87	1.469 1246	−2029.4	1.31	0.30	15 36.0
15	8 54 57.20	3.931	17 21 57.4	16.76	1.468 3344	1919.0	1.32	0.30	15 20.0
19	8 54 40.59	4.369	17 23 8.0	18.52	1.467 5909	1797.0	1.32	0.30	15 4.0
23	8 54 22.29	4.778	17 24 25.4	20.17	1.466 8982	1664.5	1.32	0.30	14 48.0
27	8 54 2.41	5.156	17 25 49.2	21.69	1.466 2607	1521.4	1.32	0.30	14 31.9
31	8 53 41.09	−5.498	+17 27 18.7	+23.04	1.465 6822	−1369.8	1.32	0.30	14 15.8

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ′ ″	″	″	° ′ ″	″		
Jan.	5	127 47 31.3	21.75	−5.4	−0 5 45.0	+0.67	1.477 7972	+4.3
	15	127 51 8.8	21.75	5.3	0 5 38.2	0.67	1.477 8015	4.3
	25	127 54 46.3	21.75	5.2	0 5 31.5	0.67	1.477 8057	4.3
Feb.	4	127 58 23.8	21.75	−5.0	−0 5 24.8	+0.67	1.477 8100	+4.2
	14	128 2 1.3	21.75	4.9	0 5 18.1	0.67	1.477 8142	4.2
	24	128 5 38.8	21.75	4.8	0 5 11.4	0.67	1.477 8184	4.2
Mar.	6	128 9 16.3	21.75	−4.7	−0 5 4.7	+0.67	1.477 8226	+4.2
	16	128 12 53.8	21.75	4.6	0 4 58.0	0.67	1.477 8268	4.2
	26	128 16 31.3	21.75	4.5	0 4 51.3	0.67	1.477 8310	4.2
Apr.	5	128 20 8.8	21.75	−4.4	−0 4 44.6	+0.67	1.477 8352	+4.2
	15	128 23 46.3	21.75	4.3	0 4 37.9	0.67	1.477 8393	4.1
	25	128 27 23.8	21.75	4.2	0 4 31.1	0.67	1.477 8435	4.1
May	5	128 31 1.3	21.75	−4.1	−0 4 24.4	+0.67	1.477 8476	+4.1
	15	128 34 38.8	21.75	4.0	0 4 17.7	0.67	1.477 8517	4.1
	25	128 38 16.2	21.75	3.9	0 4 11.0	0.67	1.477 8558	4.1
June	4	128 41 53.7	21.75	−3.8	−0 4 4.3	+0.67	1.477 8599	+4.1
	14	128 45 31.2	21.75	3.7	0 3 57.6	0.67	1.477 8640	4.1
	24	128 49 8.7	21.75	3.6	0 3 50.9	0.67	1.477 8681	4.0
July	4	128 52 46.1	21.75	−3.5	−0 3 44.2	+0.67	1.477 8721	+4.0
	14	128 56 23.6	21.75	3.4	0 3 37.4	0.67	1.477 8761	4.0
	24	129 0 1.1	21.75	3.3	0 3 30.7	0.67	1.477 8801	4.0
Aug.	3	129 3 38.6	21.74	−3.2	−0 3 24.0	+0.67	1.477 8841	+4.0
	13	129 7 16.0	21.74	3.1	0 3 17.3	0.67	1.477 8881	4.0
	23	129 10 53.5	21.74	3.0	0 3 10.6	0.67	1.477 8921	4.0
Sept.	2	129 14 30.9	21.74	−2.9	−0 3 3.9	+0.67	1.477 8961	+4.0
	12	129 18 8.4	21.74	2.8	0 2 57.2	0.67	1.477 9001	3.9
	22	129 21 45.8	21.74	2.7	0 2 50.5	0.67	1.477 9040	3.9
Oct.	2	129 25 23.3	21.74	−2.6	−0 2 43.8	+0.67	1.477 9079	+3.9
	12	129 29 0.7	21.74	2.4	0 2 37.1	0.67	1.477 9118	3.9
	22	129 32 38.2	21.74	2.3	0 2 30.4	0.67	1.477 9157	3.9
Nov.	1	129 36 15.6	21.74	−2.2	−0 2 23.7	+0.67	1.477 9196	+3.9
	11	129 39 53.0	21.74	2.1	0 2 16.9	0.67	1.477 9235	3.9
	21	129 43 30.4	21.74	2.0	0 2 10.2	0.67	1.477 9274	3.9
Dec.	1	129 47 7.8	21.74	−1.9	−0 2 3.5	+0.67	1.477 9313	+3.8
	11	129 50 45.2	21.74	1.8	0 1 56.8	0.67	1.477 9351	3.8
	21	129 54 22.7	21.74	1.7	0 1 50.1	0.67	1.477 9390	3.8
	31	129 58 0.1	21.74	−1.6	−0 1 43.4	+0.67	1.477 9428	+3.8
	41	130 1 37.5	21.74	−1.5	−0 1 36.7	+0.67	1.477 9466	+3.8

PART II.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

The constants of precession, nutation and aberration adopted by the *Conférence Internationale des Étoiles Fondamentales* which met in Paris in May, 1896, are given on page xvi, and together with the notation of Bessel are used in the formulæ which follow.

BESSELIAN STAR-NUMBERS.

Terms of Long Period.	*Terms of Short Period.*
$A=\tau-0.342\,21\sin\text{☊}$	$-0.004\,05\sin 2\,\text{☾}$
$+\,0.004\,15\sin 2\,\text{☊}$	$+0.000\,23\sin(\text{☾}+\Gamma')$
$-\,0.025\,26\sin 2\,\mathrm{L}$	$+0.001\,34\sin(\text{☾}-\Gamma')$
$+\,0.002\,51\sin(\mathrm{L}-\Gamma)$	$-0.000\,68\sin(2\,\text{☾}-\text{☊})$
$-\,0.000\,99\sin(3\,\mathrm{L}-\Gamma)$	$-0.000\,52\sin(3\,\text{☾}-\Gamma')$
$+\,0.000\,42\sin(\mathrm{L}+\Gamma)$	$+0.000\,30\sin(\text{☾}-2\,\mathrm{L}+\Gamma')$
$+\,0.000\,25\sin(2\,\mathrm{L}-\text{☊})$	$+0.000\,12\sin 2\,(\text{☾}-\mathrm{L})$
$''$	$''$
$B=-\,9.210\cos\text{☊}$	$-0.088\cos 2\,\text{☾}$
$+\,0.090\cos 2\,\text{☊}$	$-0.018\cos(2\,\text{☾}-\text{☊})$
$-\,0.551\cos 2\,\mathrm{L}$	$-0.011\cos(3\,\text{☾}-\Gamma')$
$-\,0.022\cos(3\,\mathrm{L}-\Gamma)$	$+0.005\cos(\text{☾}+\Gamma')$
$+\,0.009\cos(\mathrm{L}+\Gamma)$	
$+\,0.007\cos(2\,\mathrm{L}-\text{☊})$	

$C=-20.4700\cos\omega\cos\odot$

$D=-20.4700\sin\odot$

$E=-\,0.0415\sin\text{☊}+0''.0005\sin 2\,\text{☊}-0''.0031\sin 2\,\mathrm{L}$

Bessel's *Star-Constants.*

$a=3^{s}.072\,69+1^{s}.336\,35\sin\alpha_0\tan\delta_0$

$b=\frac{1}{15}\cos\alpha_0\tan\delta_0$

$c=\frac{1}{15}\cos\alpha_0\sec\delta_0$

$d=\frac{1}{15}\sin\alpha_0\sec\delta_0$

$a'=20''.0452\cos\alpha_0$

$b'=-\sin\alpha_0$

$c'=\tan\omega\cos\delta_0-\sin\alpha_0\sin\delta_0$

$d'=\cos\alpha_0\sin\delta_0$

Formulæ for Reduction to Apparent Position.

$\alpha=\alpha_0+\tau\mu+Aa+Bb+Cc+Dd+\frac{1}{15}E$ (in time)

$\delta=\delta_0+\tau\mu'+Aa'+Bb'+Cc'+Dd'$ (in arc)

INDEPENDENT STAR-NUMBERS.

$f+f'=+46''.0903\,A+E$ (in arc)

$=+3^{s}.07269A+\frac{1}{15}E$ (in time)

$f'=-0^{s}.0124\sin 2\,\text{☾}+0^{s}.0041\sin(\text{☾}-\Gamma')+0^{s}.0007\sin(\text{☾}+\Gamma')$
$-0^{s}.0021\sin(2\,\text{☾}-\text{☊})-0^{s}.0016\sin(3\,\text{☾}-\Gamma')$
$+0^{s}.0009\sin(\text{☾}-2\,\mathrm{L}+\Gamma')+0^{s}.0004\sin 2\,(\text{☾}-\mathrm{L})$

$g\sin G=B$

$g\cos G=20''.0452\,A$

$h\sin H=C$

$h\cos H=D$

$i=C\tan\omega$

Formulæ for Reduction to Apparent Position.

$\alpha=\alpha_0+f+f'+\tau\mu+\frac{1}{15}\,g\sin(G+\alpha_0)\tan\delta_0+\frac{1}{15}\,h\sin(H+\alpha_0)\sec\delta_0$ (in time)

$\delta=\delta_0+\tau\mu'+g\cos(G+\alpha_0)+h\cos(H+\alpha_0)\sin\delta_0+i\cos\delta_0$ (in arc)

In the above formulæ,

τ denotes the time reckoned in units of one year, from the beginning of the Besselian fictitious year (1919, January $0^{d}.701$, Washington mean time),

α_0, δ_0, the star's mean R. A. and Decl. at the beginning of the fictitious year,

α, δ, the star's apparent right ascension and declination at the time τ,

μ, μ', the annual proper motion in right ascension and declination,

$\odot$, the Sun's true longitude,
L, the Sun's mean longitude,
☊, the longitude of the Moon's ascending node,

ω, the obliquity of the ecliptic,
Γ, the long. of the Sun's perigee,
Γ', the long. of the Moon's perigee,
☾, the Moon's mean longitude.

The independent star-numbers are more convenient than **Bessel**'s when only one or two apparent positions of a star are required, or when **Bessel**'s star-constants are not known with sufficient accuracy.

In using the star-constants of the *British Association Catalogue*, a, b, c, d, a', b', c', d', with the star-numbers of this Ephemeris, the quantities to be computed are Ac, Bd, Ca, Db, $-Ac'$, $-Bd'$, $-Ca'$, $-Db'$.

In the computation of the Besselian star-numbers given for Washington mean midnight of each day of the year, on pages 202–205, the short-period terms—that is, the terms involving the Moon's mean longitude—have been included.

In the computation of the independent star-numbers, pages 206–213, the short-period terms have been included in the two columns headed G and Log g. The quantities f and f' give separately the effect of the long-period and short-period terms. f' differs but slightly from the quantity $-0''.1866 \sin 2 ☾ + 0''.0622 \sin (☾ - \Gamma')$ given on page 37 of the *Procès-Verbaux* of the Paris Conference of 1896, which quantity that conference decided should be omitted in the reduction of stars from mean to apparent place.

In computing the ephemerides of the circumpolar stars in this volume, all short-period terms have been included. The quantity f', which was omitted from the ephemerides of the circumpolar stars given in the *American Ephemeris and Nautical Almanac* for the years 1900 to 1915, inclusive, is now included in these ephemerides in accordance with the decision of the *Congrès International des Éphémérides Astronomiques* held in Paris in October, 1911. See page 43 of *Procès-Verbaux* of that Congress.

In the computation of the ephemerides of the ten-day stars, no short-period terms have been included. These terms attain two maxima and two minima during the tropical month. At maximum and minimum they may amount in right ascension to $\pm 0^s.008 \tan \delta$, and in declination to $\pm 0''.13$. For computing the effect of these terms for the correction of the positions of stars interpolated from the ten-day ephemerides, the following formulæ may be used, in which $\Delta\alpha$ and $\Delta\delta$ denote the effect of the short-period terms in right ascension and declination, respectively, and $\delta''\psi$ and $\delta''\omega$, the sum of the short-period terms of the nutation in longitude and obliquity:

$$\Delta\alpha = D_\psi\alpha \, \delta''\psi + D_\omega\alpha \, \delta''\omega$$
$$\Delta\delta = D_\psi\delta \, \delta''\psi + D_\omega\delta \, \delta''\omega$$

The values of $\delta''\psi$ and of $\delta''\omega$ for Washington mean midnight are given for each day of the year on pages 215–216, and have been computed as follows:

$$\delta''\psi = 50''.37 \, A_2 \qquad \delta''\omega = -B_2$$

in which A_2 and B_2 are the sums of the short-period terms given in the expressions for A and B on page 200.

The quantities $D_\psi\alpha$, $D_\omega\alpha$, $D_\psi\delta$, and $D_\omega\delta$ are given for each ten-day star on pages 316–513, and have been computed by means of the following formulæ:

$$D_\psi\alpha = \tfrac{1}{15} (\cos \omega + \sin \alpha \tan \delta \sin \omega) \qquad D_\omega\alpha = -\tfrac{1}{15} \cos \alpha \tan \delta$$
$$D_\psi\delta = \cos \alpha \sin \omega \qquad D_\omega\delta = \sin \alpha$$

In the *Star List of the American Ephemeris* for the years 1910 and 1911 and in the *American Ephemeris and Nautical Almanac* for the years 1912 to 1915, inclusive, the value used for the derivative of the right ascension with reference to ψ was

$$D'_\psi\alpha = \tfrac{1}{15} \sin \alpha \tan \delta \sin \omega$$

and the addition of the term $\tfrac{1}{15} \cos \omega$ is made in accordance with the above-mentioned decision of the *Congrès International des Éphémérides Astronomiques* of 1911 with reference to the quantity f'.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Jan. 0	+9.52419	+0.5360	−0.50242	+1.30480	Feb. 15	+9.67801	+0.4638	−1.19474	+1.05312
1	9.53075	0.5351	0.54517	1.30340	16	9.67846	0.4614	1.19971	1.04134
2	9.53696	0.5321	0.58395	1.30186	17	9.67894	0.4613	1.20448	1.02911
3	9.54237	0.5277	0.61943	1.30018	18	9.67966	0.4630	1.20907	1.01638
4	9.54678	0.5224	0.65209	1.29835	19	9.68074	0.4660	1.21348	1.00314
(7^{h}.0) 5	+9.55007	+0.5177	−0.68234	+1.29637	(10^{h}.0) 20	+9.68228	+0.4693	−1.21771	+0.98934
6	9.55245	0.5146	0.71048	1.29425	21	9.68432	0.4725	1.22176	0.97496
7	9.55444	0.5141	0.73679	1.29198	22	9.68687	0.4748	1.22564	0.95996
8	9.55659	0.5162	0.76145	1.28956	23	9.68985	0.4757	1.22936	0.94428
9	9.55941	0.5205	0.78466	1.28698	24	9.69298	0.4747	1.23290	0.92789
10	+9.56336	+0.5257	−0.80655	+1.28426	25	+9.69608	+0.4717	−1.23628	+0.91072
11	9.56850	0.5304	0.82726	1.28138	26	9.69886	0.4667	1.23951	0.89271
12	9.57446	0.5332	0.84690	1.27834	27	9.70104	0.4604	1.24258	0.87379
13	9.58081	0.5336	0.86554	1.27515	28	9.70254	0.4538	1.24549	0.85388
14	9.58693	0.5310	0.88329	1.27179	Mar. 1	9.70343	0.4484	1.24824	0.83288
15	+9.59230	+0.5262	−0.90021	+1.26827	2	+9.70384	+0.4453	−1.25085	+0.81069
16	9.59666	0.5201	0.91635	1.26458	3	9.70406	0.4455	1.25331	0.78717
17	9.59991	0.5139	0.93178	1.26072	4	9.70451	0.4489	1.25562	0.76218
18	9.60225	0.5088	0.94655	1.25669	5	9.70557	0.4545	1.25778	0.73554
19	9.60397	0.5053	0.96070	1.25249	6	9.70742	0.4609	1.25980	0.70703
(8^{h}.0) 20	+9.60541	+0.5039	−0.97427	+1.24810	(11^{h}.0) 7	+9.71006	+0.4663	−1.26168	+0.67639
21	9.60693	0.5045	0.98730	1.24354	8	9.71324	0.4695	1.26342	0.64331
22	9.60878	0.5064	0.99980	1.23879	9	9.71657	0.4696	1.26501	0.60738
23	9.61111	0.5091	1.01183	1.23385	10	9.71959	0.4668	1.26647	0.56808
24	9.61401	0.5120	1.02340	1.22871	11	9.72206	0.4618	1.26779	0.52475
25	+9.61749	+0.5144	−1.03452	+1.22337	12	+9.72376	+0.4559	−1.26898	+0.47650
26	9.62150	0.5159	1.04524	1.21783	13	9.72469	0.4506	1.27003	0.42210
27	9.62588	0.5158	1.05557	1.21208	14	9.72502	0.4470	1.27095	0.35977
28	9.63043	0.5138	1.06552	1.20611	15	9.72502	0.4459	1.27173	0.28688
29	9.63480	0.5098	1.07511	1.19993	16	9.72498	0.4473	1.27238	0.19913
30	+9.63871	+0.5040	−1.08436	+1.19352	17	+9.72514	+0.4509	−1.27290	+0.08894
31	9.64187	0.4971	1.09327	1.18688	18	9.72560	0.4559	1.27329	9.94080
Feb. 1	9.64417	0.4903	1.10187	1.17999	19	9.72649	0.4616	1.27354	9.71423
2	9.64568	0.4849	1.11017	1.17286	20	9.72784	0.4672	1.27367	+9.21259
3	9.64668	0.4819	1.11818	1.16548	21	9.72967	0.4722	1.27366	−9.28202
4	+9.64764	+0.4820	−1.12591	+1.15783	(12^{h}.0) 22	+9.73184	+0.4759	−1.27353	−9.73692
(9^{h}.0) 5	9.64899	0.4847	1.13336	1.14990	23	9.73429	0.4779	1.27326	9.95411
6	9.65111	0.4890	1.14055	1.14170	24	9.73678	0.4779	1.27286	0.09803
7	9.65420	0.4935	1.14749	1.13321	25	9.73915	0.4761	1.27234	0.20582
8	9.65806	0.4965	1.15418	1.12441	26	9.74112	0.4728	1.27168	0.29195
9	+9.66238	+0.4970	−1.16064	+1.11529	27	+9.74257	+0.4689	−1.27090	−0.36364
10	9.66671	0.4945	1.16686	1.10584	28	9.74343	0.4657	1.26998	0.42502
11	9.67057	0.4894	1.17286	1.09605	29	9.74376	0.4645	1.26893	0.47866
12	9.67367	0.4825	1.17864	1.08590	30	9.74391	0.4663	1.26775	0.52625
13	9.67586	0.4751	1.18421	1.07538	31	9.74418	0.4710	1.26644	0.56900
14	+9.67724	+0.4685	−1.18958	+1.06446	Apr. 1	+9.74490	+0.4783	−1.26500	−0.60776
15	+9.67801	+0.4638	−1.19474	+1.05312	2	+9.74638	+0.4867	−1.26342	−0.64322

$E = +0''.04 = +0^{s}.003$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Apr. 1	+9.74490	+0.4783	−1.26500	−0.60776	May 17	+9.82266	+0.6223	−1.01880	−1.23080
2	9.74638	0.4867	1.26342	0.64322	18	9.82534	0.6233	1.00769	1.23559
3	9.74860	0.4946	1.26171	0.67586	19	9.82785	0.6231	0.99617	1.24021
4	9.75140	0.5008	1.25986	0.70608	20	9.83000	0.6220	0.98421	1.24465
5	9.75452	0.5043	1.25788	0.73419	h 21	9.83169	0.6206	0.97180	1.24893
h 6	+9.75751	+0.5049	−1.25577	−0.76045	(16.0) 22	+9.83293	+0.6200	−0.95889	−1.25305
(13.0) 7	9.76007	0.5033	1.25351	0.78508	23	9.83384	0.6208	0.94547	1.25700
8	9.76193	0.5004	1.25112	0.80826	24	9.83470	0.6236	0.93150	1.26080
9	9.76306	0.4976	1.24859	0.83012	25	9.83577	0.6284	0.91694	1.26444
10	9.76363	0.4962	1.24591	0.85080	26	9.83734	0.6345	0.90175	1.26793
11	+9.76382	+0.4967	−1.24309	−0.87041	27	+9.83953	+0.6410	−0.88589	−1.27127
12	9.76389	0.4996	1.24013	0.88904	28	9.84235	0.6468	0.86931	1.27446
13	9.76411	0.5045	1.23702	0.90677	29	9.84562	0.6510	0.85195	1.27751
14	9.76461	0.5108	1.23376	0.92367	30	9.84903	0.6531	0.83374	1.28041
15	9.76553	0.5178	1.23036	0.93981	31	9.85227	0.6532	0.81462	1.28317
16	+9.76690	+0.5248	−1.22680	−0.95524	June 1	+9.85505	+0.6517	−0.79450	−1.28580
17	9.76865	0.5312	1.22308	0.97001	2	9.85725	0.6496	0.77328	1.28828
18	9.77079	0.5367	1.21921	0.98416	3	9.85886	0.6478	0.75085	1.29063
19	9.77319	0.5408	1.21518	0.99774	4	9.86000	0.6470	0.72707	1.29285
20	9.77574	0.5431	1.21098	1.01078	h 5	9.86091	0.6477	0.70181	1.29493
h 21	+9.77818	+0.5439	−1.20662	−1.02331	(17.0) 6	+9.86178	+0.6500	−0.67485	−1.29689
(14.0) 22	9.78040	0.5431	1.20209	1.03536	7	9.86279	0.6534	0.64600	1.29871
23	9.78215	0.5416	1.19738	1.04696	8	9.86408	0.6576	0.61498	1.30040
24	9.78340	0.5402	1.19250	1.05812	9	9.86571	0.6620	0.58144	1.30197
25	9.78416	0.5401	1.18744	1.06889	10	9.86766	0.6663	0.54497	1.30341
26	+9.78468	+0.5422	−1.18220	−1.07927	11	+9.86993	+0.6698	−0.50504	−1.30472
27	9.78520	0.5468	1.17678	1.08927	12	9.87244	0.6725	0.46094	1.30591
28	9.78610	0.5536	1.17115	1.09893	13	9.87510	0.6740	0.41173	1.30698
29	9.78762	0.5616	1.16532	1.10824	14	9.87776	0.6743	0.35608	1.30792
30	9.78986	0.5698	1.15930	1.11724	15	9.88032	0.6733	0.29213	1.30874
May 1	+9.79275	+0.5767	−1.15306	−1.12592	16	+9.88256	+0.6714	−0.21695	−1.30944
2	9.79602	0.5815	1.14662	1.13431	17	9.88443	0.6690	0.12585	1.31002
3	9.79933	0.5838	1.13995	1.14241	18	9.88586	0.6669	0.01031	1.31047
4	9.80231	0.5839	1.13306	1.15024	19	9.88692	0.6658	9.85219	1.31081
5	9.80472	0.5826	1.12593	1.15781	20	9.88780	0.6664	9.60090	1.31102
h 6	+9.80648	+0.5810	−1.11856	−1.16511	h 21	+9.88881	+0.6688	−8.93560	−1.31111
(15.0) 7	9.80761	0.5801	1.11094	1.17217	(18.0) 22	9.89012	0.6726	+9.35510	1.31109
8	9.80834	0.5807	1.10307	1.17899	23	9.89198	0.6772	9.73174	1.31094
9	9.80888	0.5831	1.09493	1.18559	24	9.89441	0.6815	9.93029	1.31067
10	9.80948	0.5872	1.08651	1.19196	25	9.89728	0.6845	0.06595	1.31028
11	+9.81030	+0.5925	−1.07780	−1.19811	26	+9.90040	+0.6858	+0.16905	−1.30977
12	9.81148	0.5987	1.06880	1.20405	27	9.90344	0.6851	0.25223	1.30914
13	9.81308	0.6049	1.05948	1.20978	28	9.90616	0.6827	0.32188	1.30839
14	9.81504	0.6108	1.04984	1.21532	29	9.90841	0.6795	0.38180	1.30752
15	9.81736	0.6158	1.03985	1.22067	30	9.91011	0.6761	0.43431	1.30652
16	+9.81993	+0.6197	−1.02951	−1.22582	July 1	+9.91133	+0.6735	+0.48105	−1.30540
17	+9.82266	+0.6223	−1.01880	−1.23080	2	+9.91226	+0.6723	+0.52315	−1.30416

$E = +0''.04 = +0^s.003$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
July 1	+9.91133	+0.6735	+0.48105	−1.30540	Aug. 16	+9.97346	+0.6477	+1.17745	−1.08805
2	9.91226	0.6723	0.52315	1.30416	17	9.97459	0.6508	1.18280	1.07811
3	9.91306	0.6724	0.56139	1.30279	18	9.97616	0.6535	1.18797	1.06782
4	9.91394	0.6740	0.59644	1.30130	19	9.97805	0.6547	1.19295	1.05714
5	9.91500	0.6764	0.62874	1.29968	20	9.98006	0.6539	1.19776	1.04606
h 6	+9.91635	+0.6791	+0.65870	−1.29794	h 21	+9.98195	+0.6512	+1.20240	−1.03456
(19.0) 7	9.91801	0.6818	0.68660	1.29607	(22.0) 22	9.98353	0.6470	1.20687	1.02261
8	9.91991	0.6841	0.71271	1.29407	23	9.98468	0.6421	1.21118	1.01019
9	9.92204	0.6855	0.73723	1.29194	24	9.98538	0.6375	1.21532	0.99728
10	9.92432	0.6859	0.76031	1.28968	25	9.98575	0.6340	1.21930	0.98384
11	+9.92664	+0.6851	+0.78212	−1.28728	26	+9.98594	+0.6323	+1.22313	−0.96983
12	9.92890	0.6831	0.80278	1.28475	27	9.98607	0.6322	1.22680	0.95522
13	9.93092	0.6801	0.82238	1.28209	28	9.98630	0.6335	1.23032	0.93998
14	9.93261	0.6765	0.84102	1.27928	29	9.98675	0.6357	1.23369	0.92404
15	9.93390	0.6729	0.85879	1.27634	30	9.98745	0.6382	1.23691	0.90736
16	+9.93486	+0.6701	+0.87573	−1.27326	31	+9.98837	+0.6405	+1.23999	−0.88987
17	9.93556	0.6687	0.89193	1.27003	Sept. 1	9.98949	0.6422	1.24292	0.87151
18	9.93623	0.6691	0.90744	1.26666	2	9.99076	0.6431	1.24572	0.85221
19	9.93712	0.6711	0.92230	1.26313	3	9.99212	0.6428	1.24837	0.83187
20	9.93840	0.6742	0.93655	1.25946	4	9.99348	0.6413	1.25088	0.81040
h 21	+9.94017	+0.6774	+0.95024	−1.25563	h 5	+9.99476	+0.6388	+1.25326	−0.78767
(20.0) 22	9.94239	0.6797	0.96339	1.25165	(23.0) 6	9.99584	0.6353	1.25550	0.76353
23	9.94490	0.6805	0.97605	1.24750	7	9.99664	0.6315	1.25761	0.73783
24	9.94746	0.6792	0.98823	1.24320	8	9.99712	0.6280	1.25958	0.71037
25	9.94980	0.6761	0.99996	1.23872	9	9.99734	0.6258	1.26142	0.68090
26	+9.95175	+0.6718	+1.01127	−1.23408	10	+9.99742	+0.6254	+1.26313	−0.64914
27	9.95321	0.6672	1.02218	1.22926	11	9.99755	0.6270	1.26471	0.61472
28	9.95421	0.6631	1.03270	1.22428	12	9.99789	0.6303	1.26616	0.57717
29	9.95489	0.6602	1.04286	1.21910	13	9.99861	0.6346	1.26748	0.53590
30	9.95541	0.6589	1.05267	1.21374	14	9.99974	0.6387	1.26867	0.49013
31	+9.95592	+0.6590	+1.06214	−1.20818	15	+0.00122	+0.6417	+1.26974	−0.43878
Aug. 1	9.95656	0.6604	1.07130	1.20244	16	0.00290	0.6429	1.27067	0.38035
2	9.95744	0.6622	1.08015	1.19649	17	0.00452	0.6420	1.27148	0.31264
3	9.95860	0.6641	1.08871	1.19033	18	0.00592	0.6394	1.27217	0.23217
4	9.95999	0.6658	1.09698	1.18396	19	0.00695	0.6359	1.27272	0.13309
h 5	+9.96157	+0.6667	+1.10498	−1.17738	h 20	+0.00755	+0.6324	+1.27315	−0.00422
(21.0) 6	9.96332	0.6667	1.11272	1.17056	(0.0) 21	0.00781	0.6298	1.27346	9.81990
7	9.96513	0.6655	1.12021	1.16352	22	0.00782	0.6289	1.27363	−9.49250
8	9.96690	0.6631	1.12745	1.15623	23	0.00777	0.6297	1.27368	+8.59219
9	9.96853	0.6596	1.13446	1.14869	24	0.00780	0.6322	1.27360	9.59017
10	+9.96990	+0.6554	+1.14124	−1.14089	25	+0.00802	+0.6357	+1.27340	+9.86893
11	9.97091	0.6509	1.14779	1.13283	26	0.00848	0.6397	1.27306	0.03729
12	9.97160	0.6471	1.15413	1.12448	27	0.00918	0.6437	1.27260	0.15827
13	9.97201	0.6445	1.16026	1.11584	28	0.01009	0.6471	1.27202	0.25274
14	9.97232	0.6439	1.16619	1.10690	29	0.01117	0.6498	1.27130	0.33021
15	+9.97274	+0.6451	+1.17192	−1.09764	30	+0.01236	+0.6514	+1.27045	+0.39586
16	+9.97346	+0.6477	+1.17745	−1.08805	Oct. 1	+0.01357	+0.6519	+1.26947	+0.45278

$E = +0''.04 = +0^s.003$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Oct. 1	+0.01357	+0.6519	+1.26947	+0.45278	Nov. 16	+0.05476	+0.7303	+1.04490	+1.21801
2	0.01472	0.6513	1.26836	0.50301	17	0.05516	0.7330	1.03425	1.22350
3	0.01575	0.6499	1.26712	0.54794	18	0.05569	0.7368	1.02320	1.22880
4	0.01654	0.6479	1.26575	0.58854	19	0.05641	0.7411	1.01171	1.23390
5	0.01704	0.6461	1.26424	0.62558	20	0.05739	0.7456	0.99977	1.23880
h (1.0) 6	+0.01731	+0.6452	+1.26260	+0.65961	h (4.0) 21	+0.05859	+0.7498	+0.98733	+1.24353
7	0.01743	0.6458	1.26082	0.69105	22	0.05995	0.7534	0.97439	1.24807
8	0.01755	0.6483	1.25890	0.72027	23	0.06145	0.7561	0.96091	1.25243
9	0.01783	0.6526	1.25684	0.74754	24	0.06302	0.7580	0.94685	1.25661
10	0.01844	0.6581	1.25464	0.77309	25	0.06458	0.7589	0.93218	1.26062
11	+0.01946	+0.6637	+1.25230	+0.79711	26	+0.06606	+0.7589	+0.91684	+1.26446
12	0.02087	0.6686	1.24982	0.81976	27	0.06738	0.7584	0.90080	1.26814
13	0.02252	0.6719	1.24719	0.84119	28	0.06848	0.7575	0.88400	1.27165
14	0.02421	0.6732	1.24441	0.86149	29	0.06935	0.7569	0.86637	1.27500
15	0.02575	0.6729	1.24148	0.88078	30	0.07001	0.7570	0.84786	1.27818
16	+0.02694	+0.6713	+1.23840	+0.89913	Dec. 1	+0.07061	+0.7583	+0.82838	+1.28122
17	0.02775	0.6695	1.23516	0.91662	2	0.07125	0.7610	0.80783	1.28409
18	0.02820	0.6683	1.23176	0.93332	3	0.07209	0.7648	0.78611	1.28681
19	0.02839	0.6684	1.22821	0.94929	4	0.07327	0.7692	0.76310	1.28938
20	0.02846	0.6701	1.22448	0.96457	5	0.07484	0.7735	0.73865	1.29180
h (2.0) 21	+0.02859	+0.6734	+1.22060	+0.97922	h (5.0) 6	+0.07674	+0.7769	+0.71259	+1.29408
22	0.02888	0.6778	1.21654	0.99326	7	0.07882	0.7789	0.68472	1.29620
23	0.02939	0.6827	1.21231	1.00675	8	0.08088	0.7793	0.65477	1.29818
24	0.03018	0.6877	1.20791	1.01971	9	0.08274	0.7783	0.62244	1.30002
25	0.03118	0.6922	1.20332	1.03218	10	0.08428	0.7766	0.58737	1.30171
26	+0.03235	+0.6961	+1.19855	+1.04417	11	+0.08545	+0.7748	+0.54905	+1.30326
27	0.03364	0.6990	1.19359	1.05572	12	0.08631	0.7736	0.50685	1.30467
28	0.03498	0.7010	1.18843	1.06685	13	0.08697	0.7735	0.45993	1.30594
29	0.03631	0.7019	1.18308	1.07758	14	0.08755	0.7745	0.40717	1.30706
30	0.03755	0.7019	1.17753	1.08792	15	0.08821	0.7767	0.34691	1.30805
31	+0.03858	+0.7013	+1.17176	+1.09790	16	+0.08901	+0.7795	+0.27675	+1.30890
Nov. 1	0.03936	0.7007	1.16578	1.10753	17	0.09004	0.7826	0.19282	1.30962
2	0.03991	0.7006	1.15959	1.11682	18	0.09127	0.7855	0.08851	1.31019
3	0.04028	0.7016	1.15317	1.12579	19	0.09267	0.7879	9.95072	1.31063
4	0.04062	0.7042	1.14650	1.13445	20	0.09419	0.7895	9.74750	1.31093
h 5	+0.04109	+0.7082	+1.13960	+1.14282	h (6.0) 21	+0.09579	+0.7904	+9.35265	+1.31109
(3.0) 6	0.04184	0.7135	1.13244	1.15091	22	0.09738	0.7903	−9.03662	1.31111
7	0.04298	0.7192	1.12503	1.15872	23	0.09892	0.7895	9.64621	1.31100
8	0.04450	0.7245	1.11736	1.16626	24	0.10032	0.7879	9.89023	1.31075
9	0.04632	0.7285	1.10940	1.17355	25	0.10151	0.7860	0.04543	1.31036
10	+0.04825	+0.7309	+1.10116	+1.18059	26	+0.10248	+0.7840	−0.15946	+1.30983
11	0.05011	0.7316	1.09261	1.18739	27	0.10324	0.7826	0.24955	1.30917
12	0.05171	0.7311	1.08375	1.19395	28	0.10385	0.7822	0.32401	1.30836
13	0.05294	0.7299	1.07456	1.20029	29	0.10448	0.7829	0.38746	1.30742
14	0.05377	0.7290	1.06503	1.20641	30	0.10521	0.7849	0.44268	1.30634
15	+0.05435	+0.7290	+1.05515	+1.21232	31	+0.10622	+0.7877	−0.49153	+1.30511
16	+0.05476	+0.7303	+1.04490	+1.21801	32	+0.10758	+0.7905	−0.53532	+1.30375

$E = +0''.03 = +0^s.002$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f	f′	G	G	H	H	Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
Jan. 0	−0.0006	+1.033	−0.003	27 8.5	1 48.6	351 2.5	23 24.2	0.87687	1.31013	−1.38	−0.1397
1	+0.0022	1.044	+0.002	26 44.2	1 46.9	350 6.1	23 20.4	0.88187	1.30992	1.52	0.1824
2	0.0049	1.054	0.006	26 15.6	1 45.0	349 9.7	23 16.6	0.88628	1.30968	1.66	0.2212
3	0.0077	1.065	0.009	25 44.8	1 43.0	348 13.1	23 12.9	0.88979	1.30943	1.81	0.2567
4	0.0104	1.076	0.009	25 15.1	1 41.0	347 16.5	23 9.1	0.89241	1.30915	1.95	0.2894
h (7.0) 5	0.0131	+1.087	+0.006	24 50.8	1 39.4	346 19.9	23 5.3	0.89427	1.30884	−2.09	−0.3196
6	0.0159	1.097	+0.002	24 34.3	1 38.3	345 23.1	23 1.5	0.89569	1.30853	2.23	0.3477
7	0.0186	1.108	−0.004	24 26.6	1 37.8	344 26.3	22 57.8	0.89722	1.30820	2.37	0.3740
8	0.0214	1.119	0.009	24 26.7	1 37.8	343 29.4	22 54.0	0.89936	1.30784	2.50	0.3987
9	0.0241	1.129	0.012	24 31.2	1 38.1	342 32.4	22 50.2	0.90248	1.30746	2.64	0.4219
10	0.0268	+1.140	−0.013	24 34.8	1 38.3	341 35.3	22 46.4	0.90667	1.30708	−2.78	−0.4438
11	0.0296	1.150	0.010	24 33.6	1 38.2	340 38.1	22 42.5	0.91167	1.30668	2.91	0.4645
12	0.0323	1.160	−0.004	24 24.5	1 37.6	339 40.8	22 38.7	0.91711	1.30625	3.05	0.4841
13	0.0350	1.171	+0.003	24 6.4	1 36.4	338 43.5	22 34.9	0.92244	1.30581	3.18	0.5028
14	0.0378	1.181	0.009	23 40.9	1 34.7	337 46.0	22 31.1	0.92714	1.30534	3.32	0.5206
15	0.0405	+1.191	+0.014	23 11.6	1 32.8	336 48.3	22 27.2	0.93091	1.30487	−3.45	−0.5375
16	0.0433	1.201	0.016	22 41.8	1 30.8	335 50.6	22 23.4	0.93368	1.30438	3.58	0.5536
17	0.0460	1.211	0.015	22 15.5	1 29.0	334 52.7	22 19.5	0.93555	1.30388	3.71	0.5690
18	0.0487	1.221	0.012	21 54.8	1 27.7	333 54.7	22 15.6	0.93683	1.30336	3.84	0.5838
19	0.0515	1.231	0.007	21 40.7	1 26.7	332 56.6	22 11.8	0.93784	1.30283	3.96	0.5980
h (8.0) 20	0.0542	+1.240	+0.001	21 33.0	1 26.2	331 58.4	22 7.9	0.93889	1.30228	−4.09	−0.6116
21	0.0570	1.250	−0.004	21 30.3	1 26.0	331 0.0	22 4.0	0.94028	1.30172	4.21	0.6246
22	0.0597	1.259	0.008	21 30.5	1 26.0	330 1.5	22 0.1	0.94214	1.30115	4.34	0.6371
23	0.0624	1.269	0.011	21 31.6	1 26.1	329 2.8	21 56.2	0.94452	1.30057	4.46	0.6491
24	0.0652	1.278	0.012	21 31.6	1 26.1	328 3.9	21 52.3	0.94742	1.29998	4.58	0.6607
25	0.0679	+1.287	−0.011	21 28.7	1 25.9	327 4.9	21 48.3	0.95076	1.29938	−4.70	−0.6718
26	0.0706	1.297	0.008	21 21.9	1 25.5	326 5.8	21 44.4	0.95444	1.29877	4.81	0.6825
27	0.0734	1.306	−0.004	21 10.0	1 24.7	325 6.5	21 40.4	0.95823	1.29815	4.93	0.6928
28	0.0761	1.315	0.000	20 52.6	1 23.5	324 7.0	21 36.5	0.96193	1.29752	5.04	0.7028
29	0.0788	1.324	+0.005	20 30.5	1 22.0	323 7.3	21 32.5	0.96525	1.29689	5.16	0.7124
30	0.0816	+1.332	+0.008	20 5.6	1 20.4	322 7.6	21 28.5	0.96799	1.29624	−5.27	−0.7216
31	0.0843	1.341	0.009	19 40.2	1 18.7	321 7.7	21 24.5	0.96999	1.29559	5.38	0.7305
Feb. 1	0.0871	1.350	0.008	19 17.6	1 17.2	320 7.5	21 20.5	0.97128	1.29494	5.48	0.7391
2	0.0898	1.358	+0.004	19 0.5	1 16.0	319 7.2	21 16.5	0.97207	1.29428	5.59	0.7474
3	0.0925	1.366	−0.001	18 51.0	1 15.4	318 6.8	21 12.5	0.97266	1.29363	5.69	0.7554
h 4	0.0953	+1.375	−0.007	18 48.8	1 15.3	317 6.2	21 8.4	0.97349	1.29298	−5.80	−0.7632
(9.0) 5	0.0980	1.383	0.011	18 52.1	1 15.5	316 5.4	21 4.4	0.97498	1.29232	5.90	0.7706
6	0.1008	1.391	0.012	18 57.5	1 15.8	315 4.5	21 0.3	0.97734	1.29164	5.99	0.7777
7	0.1035	1.399	0.010	19 0.9	1 16.1	314 3.5	20 56.2	0.98055	1.29098	6.09	0.7847
8	0.1062	1.407	−0.006	18 58.8	1 15.9	313 2.3	20 52.2	0.98433	1.29033	6.19	0.7914
9	0.1090	+1.414	0.000	18 49.4	1 15.3	312 0.9	20 48.1	0.98826	1.28967	−6.28	−0.7979
10	0.1117	1.422	+0.007	18 33.1	1 14.2	310 59.3	20 44.0	0.99189	1.28901	6.37	0.8041
11	0.1144	1.429	0.012	18 11.8	1 12.8	309 57.6	20 39.8	0.99486	1.28835	6.46	0.8101
12	0.1172	1.437	0.015	17 48.5	1 11.2	308 55.7	20 35.7	0.99700	1.28770	6.54	0.8159
13	0.1199	1.444	0.015	17 26.6	1 9.8	307 53.7	20 31.6	0.99831	1.28706	6.63	0.8215
14	0.1226	+1.452	+0.013	17 8.8	1 8.6	306 51.5	20 27.4	0.99899	1.28643	−6.71	−0.8268
15	0.1254	+1.459	+0.008	16 56.6	1 7.8	305 49.2	20 23.3	0.99929	1.28580	−6.79	−0.8320

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Feb.	15	0.1254	+1.459	+0.008	16 56.6	1 7.8	305 49.2	20 23.3	0.99929	1.28580	−6.79	−0.8320
	16	0.1281	1.466	+0.002	16 50.2	1 7.3	304 46.6	20 19.1	0.99950	1.28516	6.87	0.8370
	17	0.1309	1.473	−0.003	16 49.0	1 7.3	303 44.0	20 14.9	0.99993	1.28455	6.95	0.8417
	18	0.1336	1.480	0.007	16 51.3	1 7.4	302 41.2	20 10.7	1.00071	1.28395	7.02	0.8463
	19	0.1363	1.486	0.011	16 55.4	1 7.7	301 38.2	20 6.5	1.00194	1.28335	7.09	0.8507
h (10.0)	20	0.1391	+1.493	−0.012	16 59.3	1 8.0	300 35.1	20 2.3	1.00366	1.28277	−7.16	−0.8550
	21	0.1418	1.500	0.012	17 1.8	1 8.1	299 31.9	19 58.1	1.00580	1.28220	7.23	0.8590
	22	0.1446	1.506	0.010	17 1.4	1 8.1	298 28.5	19 53.9	1.00833	1.28164	7.29	0.8629
	23	0.1473	1.513	0.006	16 56.7	1 7.8	297 25.0	19 49.7	1.01112	1.28110	7.35	0.8666
	24	0.1500	1.519	−0.001	16 47.6	1 7.2	296 21.4	19 45.4	1.01391	1.28057	7.42	0.8702
	25	0.1528	+1.526	+0.003	16 34.3	1 6.3	295 17.6	19 41.2	1.01650	1.28005	−7.47	−0.8735
	26	0.1555	1.532	0.007	16 17.5	1 5.2	294 13.6	19 36.9	1.01865	1.27955	7.53	0.8768
	27	0.1582	1.538	0.009	15 59.4	1 4.0	293 9.6	19 32.6	1.02020	1.27907	7.58	0.8798
	28	0.1610	1.544	0.008	15 42.9	1 2.9	292 5.5	19 28.4	1.02110	1.27861	7.64	0.8828
Mar.	1	0.1637	1.550	+0.005	15 29.9	1 2.0	291 1.2	19 24.1	1.02153	1.27815	7.68	0.8855
	2	0.1665	+1.556	0.000	15 22.8	1 1.5	289 56.9	19 19.8	1.02170	1.27773	−7.73	−0.8881
	3	0.1692	1.562	−0.005	15 22.8	1 1.5	288 52.4	19 15.5	1.02191	1.27731	7.77	0.8906
	4	0.1719	1.568	0.009	15 28.7	1 1.9	287 47.9	19 11.2	1.02254	1.27692	7.81	0.8929
	5	0.1747	1.574	0.011	15 38.1	1 2.5	286 43.3	19 6.9	1.02393	1.27654	7.85	0.8950
	6	0.1774	1.580	0.010	15 47.5	1 3.2	285 38.7	19 2.6	1.02614	1.27620	7.89	0.8971
h (11.0)	7	0.1802	+1.585	−0.006	15 53.3	1 3.6	284 33.9	18 58.3	1.02899	1.27587	−7.92	−0.8989
	8	0.1829	1.591	−0.001	15 53.2	1 3.5	283 29.2	18 54.0	1.03217	1.27556	7.96	0.9007
	9	0.1856	1.597	+0.006	15 46.5	1 3.1	282 24.4	18 49.6	1.03526	1.27527	7.99	0.9023
	10	0.1884	1.602	0.012	15 34.4	1 2.3	281 19.5	18 45.3	1.03785	1.27501	8.01	0.9037
	11	0.1911	1.608	0.015	15 19.3	1 1.3	280 14.6	18 41.0	1.03979	1.27477	8.04	0.9050
	12	0.1938	+1.613	+0.016	15 4.2	1 0.3	279 9.6	18 36.6	1.04097	1.27455	−8.06	−0.9062
	13	0.1966	1.619	0.014	14 51.8	0 59.5	278 4.7	18 32.3	1.04148	1.27436	8.08	0.9073
	14	0.1993	1.624	0.010	14 44.2	0 58.9	276 59.7	18 28.0	1.04156	1.27419	8.09	0.9082
	15	0.2020	1.630	+0.004	14 42.0	0 58.8	275 54.7	18 23.6	1.04148	1.27405	8.11	0.9090
	16	0.2048	1.635	−0.001	14 44.9	0 59.0	274 49.7	18 19.3	1.04154	1.27393	8.12	0.9096
	17	0.2075	+1.641	−0.006	14 51.5	0 59.4	273 44.7	18 15.0	1.04192	1.27383	−8.13	−0.9102
	18	0.2103	1.646	0.010	15 0.4	1 0.0	272 39.8	18 10.7	1.04268	1.27376	8.14	0.9106
	19	0.2130	1.651	0.012	15 10.0	1 0.7	271 34.8	18 6.3	1.04390	1.27371	8.14	0.9108
	20	0.2157	1.657	0.012	15 18.6	1 1.2	270 29.9	18 2.0	1.04556	1.27369	8.15	0.9109
	21	0.2185	1.662	0.010	15 24.9	1 1.7	269 25.0	17 57.7	1.04759	1.27368	8.15	0.9109
h (12.0)	22	0.2212	+1.667	−0.007	15 28.0	1 1.9	268 20.1	17 53.3	1.04989	1.27371	−8.14	−0.9108
	23	0.2240	1.673	−0.004	15 27.2	1 1.8	267 15.3	17 49.0	1.05229	1.27376	8.14	0.9105
	24	0.2267	1.678	+0.001	15 22.2	1 1.5	266 10.5	17 44.7	1.05461	1.27383	8.13	0.9101
	25	0.2294	1.683	0.004	15 13.6	1 0.9	265 5.7	17 40.4	1.05668	1.27393	8.12	0.9096
	26	0.2322	1.689	0.007	15 3.1	1 0.2	264 1.1	17 36.1	1.05829	1.27405	8.11	0.9089
	27	0.2349	+1.694	+0.007	14 52.7	0 59.5	262 56.5	17 31.8	1.05939	1.27420	−8.09	−0.9082
	28	0.2376	1.700	0.005	14 44.8	0 59.0	261 52.0	17 27.5	1.05998	1.27437	8.08	0.9072
	29	0.2404	1.705	+0.001	14 41.8	0 58.8	260 47.6	17 23.2	1.06021	1.27456	8.06	0.9062
	30	0.2431	1.711	−0.004	14 44.9	0 59.0	259 43.3	17 18.9	1.06047	1.27477	8.04	0.9050
	31	0.2459	1.716	0.009	14 53.7	0 59.6	258 39.1	17 14.6	1.06103	1.27502	8.01	0.9037
Apr.	1	0.2486	+1.722	−0.011	15 6.6	1 0.4	257 35.0	17 10.3	1.06219	1.27528	−7.99	−0.9023
	2	0.2513	+1.727	−0.011	15 20.4	1 1.4	256 31.0	17 6.1	1.06415	1.27556	−7.96	−0.9007

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Apr.	1	0.2486	+1.722	−0.011	15 6.6	1 0.4	257 35.0	17 10.3	1.06219	1.27528	−7.99	−0.9023
	2	0.2513	1.727	0.011	15 20.4	1 1.4	256 31.0	17 6.1	1.06415	1.27556	7.96	0.9007
	3	0.2541	1.733	0.008	15 32.1	1 2.1	255 27.1	17 1.8	1.06677	1.27587	7.92	0.8990
	4	0.2568	1.738	−0.002	15 39.1	1 2.6	254 23.4	16 57.5	1.06982	1.27619	7.89	0.8971
	5	0.2596	1.745	+0.004	15 39.8	1 2.7	253 19.8	16 53.3	1.07296	1.27653	7.85	0.8951
h	6	0.2623	+1.750	+0.011	15 34.9	1 2.3	252 16.4	16 49.1	1.07579	1.27689	−7.82	−0.8930
(13.0)	7	0.2650	1.756	0.015	15 26.4	1 1.8	251 13.1	16 44.9	1.07804	1.27727	7.78	0.8908
	8	0.2678	1.761	0.017	15 16.7	1 1.1	250 10.0	16 40.7	1.07957	1.27768	7.73	0.8884
	9	0.2705	1.767	0.016	15 9.0	1 0.6	249 7.0	16 36.5	1.08043	1.27810	7.69	0.8858
	10	0.2732	1.773	0.012	15 4.9	1 0.3	248 4.2	16 32.3	1.08087	1.27853	7.64	0.8832
	11	0.2760	+1.779	+0.007	15 5.7	1 0.4	247 1.5	16 28.1	1.08108	1.27899	−7.59	−0.8804
	12	0.2787	1.785	+0.001	15 11.2	1 0.7	245 59.0	16 23.9	1.08134	1.27946	7.54	0.8774
	13	0.2814	1.792	−0.004	15 20.6	1 1.4	244 56.7	16 19.8	1.08188	1.27996	7.49	0.8743
	14	0.2842	1.798	0.008	15 32.2	1 2.1	243 54.6	16 15.6	1.08279	1.28046	7.43	0.8710
	15	0.2869	1.804	0.011	15 44.9	1 3.0	242 52.7	16 11.5	1.08416	1.28096	7.37	0.8676
	16	0.2897	+1.810	−0.011	15 56.6	1 3.8	241 50.9	16 7.4	1.08594	1.28148	−7.31	−0.8641
	17	0.2924	1.817	0.010	16 6.5	1 4.4	240 49.3	16 3.3	1.08806	1.28201	7.25	0.8603
	18	0.2951	1.823	0.008	16 13.5	1 4.9	239 47.9	15 59.2	1.09045	1.28256	7.19	0.8565
	19	0.2979	1.830	−0.005	16 17.0	1 5.1	238 46.7	15 55.1	1.09299	1.28312	7.12	0.8524
	20	0.3006	1.836	0.000	16 16.7	1 5.1	237 45.7	15 51.0	1.09552	1.28369	7.05	0.8482
h	21	0.3034	+1.843	+0.003	16 13.0	1 4.9	236 44.9	15 47.0	1.09783	1.28428	−6.98	−0.8439
(14.0)	22	0.3061	1.850	0.006	16 6.7	1 4.4	235 44.3	15 43.0	1.09981	1.28487	6.91	0.8394
	23	0.3088	1.856	0.007	15 59.9	1 4.0	234 43.8	15 38.9	1.10132	1.28546	6.83	0.8346
	24	0.3116	1.863	0.005	15 54.4	1 3.6	233 43.6	15 34.9	1.10237	1.28606	6.76	0.8298
	25	0.3143	1.870	+0.001	15 52.5	1 3.5	232 43.5	15 30.9	1.10306	1.28667	6.68	0.8247
	26	0.3170	+1.877	−0.004	15 55.9	1 3.7	231 43.6	15 26.9	1.10370	1.28729	−6.60	−0.8195
	27	0.3198	1.885	0.009	16 4.3	1 4.3	230 44.0	15 22.9	1.10452	1.28792	6.52	0.8140
	28	0.3225	1.892	0.012	16 16.9	1 5.1	229 44.5	15 19.0	1.10589	1.28855	6.43	0.8084
	29	0.3253	1.899	0.013	16 30.9	1 6.1	228 45.3	15 15.0	1.10793	1.28917	6.35	0.8026
	30	0.3280	1.907	0.010	16 43.8	1 6.9	227 46.2	15 11.1	1.11065	1.28981	6.26	0.7966
May	1	0.3307	+1.914	−0.005	16 52.5	1 7.5	226 47.4	15 7.2	1.11388	1.29044	−6.17	−0.7903
	2	0.3335	1.922	+0.002	16 55.8	1 7.7	225 48.7	15 3.3	1.11727	1.29107	6.08	0.7839
	3	0.3362	1.929	0.009	16 53.6	1 7.6	224 50.3	14 59.4	1.12049	1.29171	5.99	0.7772
	4	0.3390	1.937	0.014	16 47.3	1 7.2	223 52.0	14 55.5	1.12323	1.29234	5.89	0.7703
	5	0.3417	1.945	0.017	16 39.3	1 6.6	222 53.9	14 51.6	1.12534	1.29297	5.80	0.7632
h	6	0.3444	+1.953	+0.017	16 32.0	1 6.1	221 56.1	14 47.7	1.12683	1.29359	−5.70	−0.7558
(15.0)	7	0.3472	1.961	0.014	16 27.6	1 5.8	220 58.5	14 43.9	1.12779	1.29422	5.60	0.7482
	8	0.3499	1.969	0.009	16 27.2	1 5.8	220 1.0	14 40.1	1.12851	1.29484	5.50	0.7403
	9	0.3526	1.977	+0.004	16 31.3	1 6.1	219 3.8	14 36.3	1.12920	1.29547	5.40	0.7322
	10	0.3554	1.986	−0.002	16 38.9	1 6.6	218 6.7	14 32.4	1.13009	1.29609	5.29	0.7238
	11	0.3581	+1.994	−0.006	16 48.7	1 7.2	217 9.8	14 28.6	1.13128	1.29670	−5.19	−0.7151
	12	0.3608	2.002	0.009	16 59.8	1 8.0	216 13.1	14 24.9	1.13288	1.29730	5.08	0.7061
	13	0.3636	2.011	0.011	17 10.0	1 8.7	215 16.7	14 21.1	1.13488	1.29790	4.97	0.6967
	14	0.3663	2.020	0.010	17 18.7	1 9.2	214 20.3	14 17.4	1.13718	1.29849	4.86	0.6871
	15	0.3691	2.028	0.008	17 24.8	1 9.7	213 24.2	14 13.6	1.13974	1.29908	4.75	0.6771
	16	0.3718	+2.037	−0.005	17 27.9	1 9.9	212 28.2	14 9.9	1.14244	1.29965	−4.64	−0.6668
	17	0.3745	+2.046	−0.001	17 27.5	1 9.8	211 32.4	14 6.2	1.14515	1.30022	−4.53	−0.6561

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	*f*	*f′*	*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
May	17	0.3745	+2.046	−0.001	17 27.5	1 9.8	211 32.4	14 6.2	1.14515	1.30022	−4.53	−0.6561
	18	0.3773	2.055	+0.003	17 23.8	1 9.6	210 36.8	14 2.5	1.14768	1.30078	4.42	0.6450
	19	0.3800	2.064	0.006	17 17.6	1 9.2	209 41.3	13 58.8	1.14993	1.30132	4.30	0.6334
	20	0.3828	2.073	0.007	17 10.2	1 8.7	208 46.0	13 55.1	1.15181	1.30186	4.18	0.6215
h	21	0.3855	2.082	0.006	17 3.6	1 8.2	207 50.8	13 51.4	1.15324	1.30238	4.06	0.6091
(16.0)	22	0.3882	+2.091	+0.003	16 59.3	1 8.0	206 55.7	13 47.7	1.15432	1.30289	−3.95	−0.5962
	23	0.3910	2.100	−0.002	16 59.2	1 7.9	206 0.9	13 44.1	1.15523	1.30339	3.82	0.5827
	24	0.3937	2.110	0.008	17 3.6	1 8.2	205 6.2	13 40.4	1.15625	1.30388	3.70	0.5688
	25	0.3964	2.119	0.012	17 11.7	1 8.8	204 11.6	13 36.8	1.15764	1.30437	3.58	0.5542
	26	0.3992	2.129	0.014	17 22.0	1 9.5	203 17.1	13 33.1	1.15961	1.30483	3.46	0.5390
	27	0.4019	+2.138	−0.013	17 31.7	1 10.1	202 22.8	13 29.5	1.16219	1.30528	−3.34	−0.5232
	28	0.4047	2.148	0.008	17 38.5	1 10.6	201 28.5	13 25.9	1.16528	1.30571	3.21	0.5066
	29	0.4074	2.158	−0.002	17 40.6	1 10.7	200 34.4	13 22.3	1.16864	1.30613	3.08	0.4892
	30	0.4101	2.167	+0.005	17 37.6	1 10.5	199 40.4	13 18.7	1.17195	1.30653	2.96	0.4710
	31	0.4129	2.177	0.012	17 30.4	1 10.0	198 46.6	13 15.1	1.17488	1.30692	2.83	0.4519
June	1	0.4156	+2.187	+0.016	17 20.8	1 9.4	197 52.9	13 11.5	1.17727	1.30731	−2.70	−0.4318
	2	0.4184	2.197	0.017	17 11.2	1 8.7	196 59.2	13 8.0	1.17910	1.30767	2.57	0.4105
	3	0.4211	2.207	0.015	17 3.5	1 8.2	196 5.7	13 4.4	1.18041	1.30800	2.44	0.3881
	4	0.4238	2.217	0.011	16 59.3	1 8.0	195 12.3	13 0.8	1.18139	1.30833	2.31	0.3643
h	5	0.4266	2.227	+0.006	16 58.8	1 7.9	194 19.0	12 57.3	1.18228	1.30863	2.18	0.3391
(17.0)	6	0.4293	+2.237	0.000	17 1.8	1 8.1	193 25.7	12 53.7	1.18326	1.30893	−2.05	−0.3121
	7	0.4320	2.247	−0.005	17 7.2	1 8.5	192 32.6	12 50.2	1.18449	1.30920	1.92	0.2833
	8	0.4348	2.257	0.008	17 13.7	1 8.9	191 39.5	12 46.6	1.18603	1.30946	1.79	0.2522
	9	0.4375	2.267	0.010	17 20.0	1 9.3	190 46.5	12 43.1	1.18790	1.30970	1.65	0.2187
	10	0.4402	2.278	0.010	17 25.2	1 9.7	189 53.6	12 39.6	1.19006	1.30992	1.52	0.1822
	11	0.4430	+2.288	−0.008	17 28.1	1 9.9	189 0.7	12 36.0	1.19244	1.31011	−1.39	−0.1423
	12	0.4457	2.298	0.005	17 28.5	1 9.9	188 7.9	12 32.5	1.19497	1.31030	1.25	0.0982
	13	0.4485	2.309	−0.002	17 26.0	1 9.7	187 15.2	12 29.0	1.19753	1.31048	1.12	0.0490
	14	0.4512	2.319	+0.002	17 20.6	1 9.4	186 22.5	12 25.5	1.19997	1.31062	0.98	9.9933
	15	0.4539	2.329	0.006	17 12.6	1 8.8	185 29.9	12 22.0	1.20222	1.31074	0.85	9.9294
	16	0.4567	+2.340	+0.007	17 3.2	1 8.2	184 37.2	12 18.5	1.20410	1.31085	−0.71	−9.8542
	17	0.4594	2.350	0.007	16 53.8	1 7.6	183 44.6	12 15.0	1.20560	1.31095	0.58	9.7631
	18	0.4622	2.360	+0.004	16 46.1	1 7.1	182 52.1	12 11.5	1.20674	1.31102	0.44	9.6476
	19	0.4649	2.371	0.000	16 41.5	1 6.8	181 59.6	12 8.0	1.20762	1.31107	0.31	9.4894
	20	0.4676	2.381	−0.006	16 40.9	1 6.7	181 7.0	12 4.5	1.20849	1.31110	0.17	9.2382
h	21	0.4704	+2.391	−0.011	16 43.8	1 6.9	180 14.5	12 1.0	1.20960	1.31111	−0.04	−8.5729
(18.0)	22	0.4731	2.402	0.014	16 49.3	1 7.3	179 22.0	11 57.5	1.21112	1.31112	+0.10	+8.9924
	23	0.4758	2.412	0.014	16 55.3	1 7.7	178 29.4	11 54.0	1.21321	1.31109	0.23	9.3690
	24	0.4786	2.423	0.011	16 59.3	1 8.0	177 36.9	11 50.5	1.21580	1.31105	0.37	9.5676
	25	0.4813	2.433	−0.005	16 59.8	1 8.0	176 44.4	11 47.0	1.21868	1.31098	0.50	9.7032
	26	0.4841	+2.444	+0.002	16 55.7	1 7.7	175 51.9	11 43.5	1.22165	1.31090	+0.64	+9.8063
	27	0.4868	2.454	0.009	16 47.5	1 7.2	174 59.2	11 40.0	1.22437	1.31081	0.77	9.8895
	28	0.4895	2.464	0.014	16 36.4	1 6.4	174 6.6	11 36.4	1.22668	1.31069	0.91	9.9591
	29	0.4923	2.475	0.016	16 24.5	1 5.6	173 14.0	11 32.9	1.22848	1.31056	1.05	0.0191
	30	0.4950	2.485	0.016	16 13.7	1 4.9	172 21.4	11 29.4	1.22978	1.31040	1.18	0.0716
July	1	0.4978	+2.495	+0.012	16 5.7	1 4.4	171 28.7	11 25.9	1.23071	1.31022	+1.31	+0.1183
	2	0.5005	+2.505	+0.007	16 1.1	1 4.1	170 35.9	11 22.4	1.23146	1.31003	+1.45	+0.1604

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
July	1	0.4978	+2.495	+0.012	16 5.7	1 4.4	171 28.7	11 25.9	1.23071	1.31022	+1.31	+0.1183
	2	0.5005	2.505	0.007	16 1.1	1 4.1	170 35.9	11 22.4	1.23146	1.31003	1.45	0.1604
	3	0.5032	2.516	+0.002	15 59.7	1 4.0	169 43.2	11 18.9	1.23222	1.30982	1.58	0.1986
	4	0.5060	2.526	−0.003	16 1.1	1 4.1	168 50.3	11 15.4	1.23314	1.30959	1.71	0.2337
	5	0.5087	2.536	0.007	16 3.9	1 4.3	167 57.4	11 11.8	1.23431	1.30935	1.85	0.2660
h	6	0.5114	+2.546	−0.009	16 6.9	1 4.5	167 4.5	11 8.3	1.23577	1.30908	+1.98	+0.2960
(19.0)	7	0.5142	2.556	0.010	16 9.1	1 4.6	166 11.5	11 4.8	1.23751	1.30881	2.11	0.3239
	8	0.5169	2.566	0.009	16 9.8	1 4.7	165 18.4	11 1.2	1.23943	1.30852	2.24	0.3500
	9	0.5196	2.576	0.006	16 8.3	1 4.5	164 25.3	10 57.7	1.24151	1.30821	2.37	0.3745
	10	0.5224	2.586	−0.002	16 4.3	1 4.3	163 32.1	10 54.1	1.24364	1.30786	2.50	0.3976
	11	0.5251	+2.596	+0.002	15 57.9	1 3.9	162 38.8	10 50.6	1.24574	1.30751	+2.63	+0.4194
	12	0.5279	2.606	0.005	15 49.0	1 3.3	161 45.4	10 47.0	1.24767	1.30714	2.75	0.4400
	13	0.5306	2.616	0.008	15 38.6	1 2.6	160 51.9	10 43.5	1.24932	1.30677	2.88	0.4596
	14	0.5333	2.626	0.008	15 27.7	1 1.8	159 58.3	10 39.9	1.25063	1.30637	3.01	0.4783
	15	0.5361	2.635	0.006	15 17.8	1 1.2	159 4.6	10 36.3	1.25160	1.30597	3.13	0.4960
	16	0.5388	+2.645	+0.002	15 10.2	1 0.7	158 10.8	10 32.7	1.25228	1.30555	+3.26	+0.5130
	17	0.5416	2.654	−0.003	15 6.1	1 0.4	157 16.9	10 29.1	1.25283	1.30511	3.38	0.5292
	18	0.5443	2.664	0.008	15 5.5	1 0.4	156 22.8	10 25.5	1.25348	1.30466	3.51	0.5447
	19	0.5470	2.673	0.012	15 7.8	1 0.5	155 28.6	10 21.9	1.25445	1.30419	3.63	0.5596
	20	0.5498	2.683	0.014	15 11.4	1 0.8	154 34.3	10 18.3	1.25586	1.30371	3.75	0.5738
h	21	0.5525	+2.692	−0.012	15 14.2	1 0.9	153 39.9	10 14.7	1.25772	1.30322	+3.87	+0.5875
(20.0)	22	0.5552	2.701	0.008	15 14.5	1 1.0	152 45.3	10 11.0	1.25995	1.30272	3.99	0.6006
	23	0.5580	2.710	−0.001	15 11.0	1 0.7	151 50.5	10 7.4	1.26234	1.30220	4.10	0.6133
	24	0.5607	2.719	+0.006	15 3.3	1 0.2	150 55.7	10 3.7	1.26464	1.30168	4.22	0.6255
	25	0.5635	2.728	0.011	14 52.6	0 59.5	150 0.7	10 0.0	1.26662	1.30114	4.34	0.6372
	26	0.5662	+2.737	+0.015	14 40.4	0 58.7	149 5.5	9 56.4	1.26816	1.30060	+4.45	+0.6485
	27	0.5689	2.746	0.015	14 28.7	0 57.9	148 10.2	9 52.7	1.26924	1.30004	4.56	0.6594
	28	0.5717	2.755	0.013	14 19.0	0 57.3	147 14.8	9 49.0	1.26992	1.29948	4.68	0.6700
	29	0.5744	2.764	0.009	14 12.2	0 56.8	146 19.2	9 45.3	1.27039	1.29891	4.79	0.6801
	30	0.5772	2.772	+0.003	14 8.8	0 56.6	145 23.4	9 41.6	1.27079	1.29832	4.90	0.6899
	31	0.5799	+2.781	−0.002	14 8.1	0 56.5	144 27.4	9 37.8	1.27128	1.29773	+5.00	+0.6994
Aug.	1	0.5826	2.789	0.006	14 9.4	0 56.6	143 31.3	9 34.1	1.27196	1.29714	5.11	0.7086
	2	0.5854	2.798	0.009	14 11.1	0 56.7	142 35.0	9 30.3	1.27289	1.29654	5.21	0.7174
	3	0.5881	2.806	0.010	14 12.6	0 56.8	141 38.6	9 26.6	1.27411	1.29592	5.32	0.7260
	4	0.5908	2.814	0.009	14 13.1	0 56.9	140 42.0	9 22.8	1.27551	1.29531	5.42	0.7342
h	5	0.5936	+2.822	−0.007	14 11.8	0 56.8	139 45.2	9 19.0	1.27705	1.29470	+5.52	+0.7422
(21.0)	6	0.5963	2.830	−0.004	14 8.6	0 56.6	138 48.2	9 15.2	1.27870	1.29408	5.62	0.7500
	7	0.5990	2.838	0.000	14 3.0	0 56.2	137 51.1	9 11.4	1.28033	1.29346	5.72	0.7575
	8	0.6018	2.846	+0.004	13 55.3	0 55.7	136 53.8	9 7.6	1.28186	1.29284	5.82	0.7647
	9	0.6045	2.854	0.007	13 45.8	0 55.1	135 56.3	9 3.8	1.28319	1.29221	5.91	0.7717
	10	0.6073	+2.861	+0.008	13 35.6	0 54.4	134 58.6	8 59.9	1.28425	1.29158	+6.01	+0.7785
	11	0.6100	2.869	0.007	13 25.8	0 53.7	134 0.8	8 56.1	1.28496	1.29096	6.10	0.7850
	12	0.6127	2.876	+0.004	13 17.8	0 53.2	133 2.7	8 52.2	1.28541	1.29032	6.19	0.7914
	13	0.6155	2.884	0.000	13 12.5	0 52.8	132 4.5	8 48.3	1.28566	1.28970	6.27	0.7975
	14	0.6182	2.891	−0.006	13 10.8	0 52.7	131 6.1	8 44.4	1.28592	1.28908	6.36	0.8034
	15	0.6210	+2.898	−0.010	13 12.2	0 52.8	130 7.4	8 40.5	1.28639	1.28845	+6.44	+0.8092
	16	0.6237	+2.906	−0.013	13 15.5	0 53.0	129 8.6	8 36.6	1.28721	1.28784	+6.53	+0.8147

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Aug.	16	0.6237	+2.906	−0.013	13 15.5	0 53.0	129 8.6	8 36.6	1.28721	1.28784	+6.53	+0.8147
	17	0.6264	2.913	0.012	13 19.1	0 53.3	128 9.6	8 32.6	1.28844	1.28722	6.61	0.8201
	18	0.6292	2.920	0.009	13 21.0	0 53.4	127 10.4	8 28.7	1.29007	1.28662	6.69	0.8252
	19	0.6319	2.927	−0.003	13 19.7	0 53.3	126 11.0	8 24.7	1.29192	1.28601	6.76	0.8302
	20	0.6346	2.934	+0.004	13 14.9	0 53.0	125 11.4	8 20.8	1.29379	1.28541	6.84	0.8350
h	21	0.6374	+2.940	+0.010	13 6.8	0 52.5	124 11.7	8 16.8	1.29543	1.28483	+6.91	+0.8397
(22.0)	22	0.6401	2.947	0.014	12 56.6	0 51.8	123 11.7	8 12.8	1.29672	1.28424	6.98	0.8441
	23	0.6429	2.954	0.015	12 46.3	0 51.1	122 11.5	8 8.8	1.29757	1.28367	7.05	0.8484
	24	0.6456	2.960	0.013	12 37.3	0 50.5	121 11.1	8 4.7	1.29802	1.28311	7.12	0.8526
	25	0.6483	2.966	0.010	12 30.9	0 50.1	120 10.6	8 0.7	1.29821	1.28254	7.19	0.8566
	26	0.6511	+2.973	+0.004	12 27.6	0 49.8	119 9.9	7 56.7	1.29830	1.28199	+7.25	+0.8604
	27	0.6538	2.979	−0.001	12 27.2	0 49.8	118 9.0	7 52.6	1.29844	1.28147	7.31	0.8641
	28	0.6566	2.985	0.005	12 29.0	0 49.9	117 8.0	7 48.5	1.29872	1.28096	7.37	0.8676
	29	0.6593	2.991	0.009	12 32.0	0 50.1	116 6.8	7 44.5	1.29923	1.28045	7.43	0.8710
	30	0.6620	2.998	0.010	12 35.0	0 50.3	115 5.4	7 40.4	1.30002	1.27995	7.49	0.8742
	31	0.6648	+3.004	−0.010	12 37.4	0 50.5	114 3.8	7 36.3	1.30101	1.27948	+7.54	+0.8772
Sept.	1	0.6675	3.010	0.008	12 38.4	0 50.6	113 2.1	7 32.1	1.30215	1.27901	7.59	0.8802
	2	0.6702	3.016	0.005	12 37.7	0 50.5	112 0.2	7 28.0	1.30340	1.27856	7.64	0.8830
	3	0.6730	3.021	−0.001	12 34.8	0 50.3	110 58.2	7 23.9	1.30468	1.27813	7.70	0.8856
	4	0.6757	3.027	+0.002	12 30.1	0 50.0	109 56.1	7 19.7	1.30591	1.27772	7.73	0.8881
h	5	0.6784	+3.033	+0.005	12 23.7	0 49.6	108 53.8	7 15.6	1.30701	1.27732	+7.77	+0.8905
(23.0)	6	0.6812	3.039	0.007	12 16.2	0 49.1	107 51.3	7 11.4	1.30789	1.27694	7.81	0.8928
	7	0.6839	3.044	0.007	12 8.7	0 48.6	106 48.7	7 7.2	1.30848	1.27657	7.85	0.8949
	8	0.6867	3.050	0.005	12 2.3	0 48.2	105 46.0	7 3.1	1.30879	1.27623	7.88	0.8968
	9	0.6894	3.055	+0.001	11 58.4	0 47.9	104 43.2	6 58.9	1.30890	1.27592	7.92	0.8987
	10	0.6921	+3.061	−0.004	11 57.6	0 47.8	103 40.2	6 54.7	1.30896	1.27561	+7.95	+0.9004
	11	0.6949	3.066	0.009	12 0.0	0 48.0	102 37.2	6 50.5	1.30916	1.27533	7.98	0.9020
	12	0.6976	3.072	0.012	12 4.8	0 48.3	101 34.0	6 46.3	1.30964	1.27507	8.01	0.9034
	13	0.7004	3.077	0.012	12 10.5	0 48.7	100 30.7	6 42.1	1.31050	1.27483	8.03	0.9047
	14	0.7031	3.082	0.009	12 15.4	0 49.0	99 27.2	6 37.8	1.31176	1.27461	8.05	0.9059
	15	0.7058	+3.088	−0.004	12 17.9	0 49.2	98 23.6	6 33.6	1.31332	1.27442	+8.07	+0.9070
	16	0.7086	3.093	+0.002	12 17.1	0 49.1	97 20.1	6 29.3	1.31497	1.27424	8.09	0.9079
	17	0.7113	3.098	0.009	12 13.0	0 48.9	96 16.5	6 25.1	1.31648	1.27409	8.10	0.9087
	18	0.7140	3.104	0.014	12 6.5	0 48.4	95 12.7	6 20.8	1.31770	1.27397	8.12	0.9094
	19	0.7168	3.109	0.016	11 59.1	0 47.9	94 8.8	6 16.6	1.31853	1.27386	8.13	0.9100
h	20	0.7195	+3.114	+0.015	11 52.5	0 47.4	93 4.9	6 12.3	1.31896	1.27378	+8.14	+0.9104
(0.0)	21	0.7223	3.119	0.011	11 48.1	0 47.2	92 0.9	6 8.1	1.31910	1.27373	8.14	0.9107
	22	0.7250	3.125	0.006	11 46.6	0 47.1	90 56.9	6 3.8	1.31907	1.27369	8.15	0.9109
	23	0.7277	3.130	+0.001	11 48.0	0 47.2	89 52.8	5 59.5	1.31906	1.27368	8.15	0.9109
	24	0.7305	3.135	−0.004	11 51.8	0 47.3	88 48.8	5 55.3	1.31919	1.27369	8.15	0.9109
	25	0.7332	+3.140	−0.008	11 57.1	0 47.8	87 44.7	5 51.0	1.31955	1.27373	+8.14	+0.9107
	26	0.7360	3.145	0.010	12 2.8	0 48.2	86 40.5	5 46.7	1.32017	1.27380	8.13	0.9103
	27	0.7387	3.151	0.010	12 8.1	0 48.5	85 36.3	5 42.4	1.32100	1.27388	8.13	0.9099
	28	0.7414	3.156	0.010	12 12.3	0 48.8	84 32.1	5 38.1	1.32203	1.27400	8.12	0.9093
	29	0.7442	3.161	0.006	12 14.9	0 49.0	83 28.0	5 33.9	1.32318	1.27413	8.10	0.9086
	30	0.7469	+3.166	−0.003	12 15.6	0 49.0	82 23.8	5 29.6	1.32439	1.27428	+8.09	+0.9077
Oct.	1	0.7496	+3.172	+0.001	12 14.4	0 49.0	81 19.7	5 25.3	1.32557	1.27447	+8.07	+0.9067

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Oct.	1	0.7496	+3.172	+0.001	12 14.4	0 49.0	81 19.7	5 25.3	1.32557	1.27447	+8.07	+0.9067
	2	0.7524	3.177	0.004	12 11.6	0 48.8	80 15.6	5 21.0	1.32664	1.27467	8.05	0.9056
	3	0.7551	3.182	0.006	12 7.5	0 48.5	79 11.5	5 16.8	1.32756	1.27489	8.02	0.9044
	4	0.7578	3.188	0.007	12 3.0	0 48.2	78 7.5	5 12.5	1.32823	1.27515	8.00	0.9030
h	5	0.7606	3.193	0.005	11 59.3	0 48.0	77 3.5	5 8.2	1.32863	1.27542	7.97	0.9015
(1.0)	6	0.7633	+3.198	+0.001	11 57.4	0 47.8	75 59.6	5 4.0	1.32884	1.27571	+7.94	+0.8999
	7	0.7661	3.204	−0.003	11 58.2	0 47.9	74 55.7	4 59.7	1.32899	1.27602	7.91	0.8981
	8	0.7688	3.209	0.008	12 2.1	0 48.1	73 51.9	4 55.5	1.32922	1.27636	7.87	0.8962
	9	0.7715	3.215	0.011	12 8.6	0 48.6	72 48.1	4 51.2	1.32967	1.27671	7.84	0.8941
	10	0.7743	3.220	0.012	12 16.5	0 49.1	71 44.4	4 47.0	1.33050	1.27708	7.80	0.8919
	11	0.7770	+3.226	−0.011	12 24.1	0 49.6	70 40.8	4 42.7	1.33172	1.27747	+7.76	+0.8896
	12	0.7798	3.232	−0.006	12 29.9	0 50.0	69 37.3	4 38.5	1.33330	1.27789	7.71	0.8871
	13	0.7825	3.238	+0.001	12 32.7	0 50.2	68 33.8	4 34.3	1.33502	1.27832	7.66	0.8844
	14	0.7852	3.244	0.007	12 32.1	0 50.1	67 30.4	4 30.0	1.33669	1.27877	7.61	0.8817
	15	0.7880	3.249	0.013	12 28.9	0 49.9	66 27.1	4 25.8	1.33815	1.27924	7.56	0.8787
	16	0.7907	+3.255	+0.016	12 24.3	0 49.6	65 23.9	4 21.6	1.33921	1.27972	+7.51	+0.8757
	17	0.7934	3.261	0.016	12 20.0	0 49.3	64 20.9	4 17.4	1.33990	1.28022	7.45	0.8724
	18	0.7962	3.267	0.013	12 17.2	0 49.1	63 17.9	4 13.2	1.34028	1.28074	7.40	0.8690
	19	0.7989	3.274	0.009	12 17.1	0 49.1	62 15.0	4 9.0	1.34046	1.28127	7.34	0.8655
h	20	0.8017	3.280	+0.003	12 19.9	0 49.3	61 12.3	4 4.8	1.34061	1.28181	7.27	0.8617
(2.0)	21	0.8044	+3.286	−0.002	12 25.0	0 49.7	60 9.7	4 0.6	1.34088	1.28236	+7.21	+0.8579
	22	0.8071	3.293	0.007	12 31.9	0 50.1	59 7.2	3 56.5	1.34136	1.28293	7.14	0.8538
	23	0.8099	3.299	0.009	12 39.3	0 50.6	58 4.8	3 52.3	1.34208	1.28351	7.07	0.8496
	24	0.8126	3.306	0.010	12 46.4	0 51.1	57 2.6	3 48.2	1.34307	1.28410	7.00	0.8452
	25	0.8154	3.312	0.009	12 52.5	0 51.5	56 0.5	3 44.0	1.34425	1.28470	6.93	0.8406
	26	0.8181	+3.319	−0.007	12 57.2	0 51.8	54 58.5	3 39.9	1.34556	1.28532	+6.85	+0.8358
	27	0.8208	3.326	−0.004	13 0.0	0 52.0	53 56.7	3 35.8	1.34693	1.28594	6.77	0.8308
	28	0.8236	3.333	0.000	13 1.1	0 52.1	52 55.0	3 31.7	1.34830	1.28656	6.69	0.8257
	29	0.8263	3.340	+0.003	13 0.4	0 52.0	51 53.5	3 27.6	1.34961	1.28719	6.61	0.8203
	30	0.8290	3.347	0.005	12 58.2	0 51.9	50 52.2	3 23.5	1.35079	1.28783	6.53	0.8148
	31	0.8318	+3.354	+0.006	12 55.5	0 51.7	49 50.9	3 19.4	1.35173	1.28847	+6.44	+0.8090
Nov.	1	0.8345	3.361	0.005	12 53.0	0 51.5	48 49.8	3 15.3	1.35244	1.28912	6.35	0.8030
	2	0.8372	3.368	+0.002	12 51.9	0 51.5	47 49.0	3 11.3	1.35296	1.28977	6.26	0.7968
	3	0.8400	3.376	−0.003	12 53.0	0 51.5	46 48.3	3 7.2	1.35336	1.29042	6.17	0.7904
	4	0.8427	3.384	0.007	12 56.8	0 51.8	45 47.7	3 3.2	1.35383	1.29107	6.08	0.7838
h	5	0.8454	+3.391	−0.012	13 3.1	0 52.2	44 47.2	2 59.1	1.35446	1.29172	+5.98	+0.7769
(3.0)	6	0.8482	3.399	0.014	13 11.0	0 52.7	43 46.9	2 55.1	1.35545	1.29239	5.88	0.7697
	7	0.8509	3.407	0.013	13 19.1	0 53.3	42 46.8	2 51.1	1.35683	1.29305	5.78	0.7623
	8	0.8537	3.415	0.009	13 25.8	0 53.7	41 46.9	2 47.1	1.35855	1.29370	5.68	0.7546
	9	0.8564	3.423	−0.002	13 29.7	0 54.0	40 47.1	2 43.1	1.36049	1.29435	5.58	0.7467
	10	0.8592	+3.431	+0.005	13 30.5	0 54.0	39 47.4	2 39.2	1.36244	1.29500	+5.48	+0.7384
	11	0.8619	3.439	0.011	13 28.5	0 53.9	38 47.8	2 35.2	1.36424	1.29564	5.37	0.7299
	12	0.8646	3.447	0.016	13 24.6	0 53.6	37 48.5	2 31.2	1.36573	1.29629	5.26	0.7210
	13	0.8674	3.456	0.017	13 20.4	0 53.4	36 49.2	2 27.3	1.36683	1.29692	5.15	0.7118
	14	0.8701	3.464	0.015	13 17.3	0 53.3	35 50.1	2 23.3	1.36757	1.29755	5.04	0.7023
	15	0.8728	+3.473	+0.011	13 16.2	0 53.1	34 51.1	2 19.4	1.36812	1.29817	+4.92	+0.6924
	16	0.8756	+3.482	+0.006	13 17.9	0 53.2	33 52.3	2 15.5	1.36858	1.29878	+4.81	+0.6822

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Nov.	16	0.8756	+3.482	+0.006	13 17.9	0 53.2	33 52.3	2 15.5	1.36858	1.29878	+4.81	+0.6822
	17	0.8783	3.491	0.000	13 22.0	0 53.5	32 53.6	2 11.6	1.36910	1.29939	4.69	0.6715
	18	0.8811	3.500	−0.005	13 27.7	0 53.8	31 55.1	2 7.7	1.36980	1.30000	4.58	0.6605
	19	0.8838	3.509	0.008	13 34.3	0 54.3	30 56.6	2 3.8	1.37072	1.30058	4.46	0.6490
h	20	0.8865	3.518	0.009	13 40.6	0 54.7	29 58.4	1 59.9	1.37189	1.30115	4.34	0.6370
(4.0)	21	0.8893	+3.527	−0.009	13 46.0	0 55.1	29 0.2	1 56.0	1.37326	1.30172	+4.21	+0.6246
	22	0.8920	3.536	0.007	13 50.2	0 55.3	28 2.1	1 52.1	1.37475	1.30228	4.09	0.6117
	23	0.8948	3.546	−0.004	13 52.3	0 55.5	27 4.2	1 48.3	1.37632	1.30282	3.96	0.5982
	24	0.8975	3.555	0.000	13 52.8	0 55.5	26 6.4	1 44.4	1.37791	1.30334	3.84	0.5841
	25	0.9002	3.565	+0.003	13 51.7	0 55.4	25 8.7	1 40.6	1.37943	1.30386	3.71	0.5694
	26	0.9030	+3.574	+0.005	13 49.1	0 55.3	24 11.2	1 36.7	1.38082	1.30437	+3.58	+0.5541
	27	0.9057	3.584	0.006	13 45.6	0 55.0	23 13.7	1 32.9	1.38204	1.30485	3.45	0.5381
	28	0.9084	3.594	0.006	13 42.0	0 54.8	22 16.4	1 29.1	1.38303	1.30533	3.32	0.5213
	29	0.9112	3.604	+0.003	13 39.3	0 54.6	21 19.2	1 25.3	1.38381	1.30579	3.19	0.5036
	30	0.9139	3.614	−0.001	13 38.3	0 54.6	20 22.1	1 21.5	1.38444	1.30623	3.06	0.4851
Dec.	1	0.9166	+3.624	−0.006	13 39.7	0 54.6	19 25.0	1 17.7	1.38508	1.30665	+2.92	+0.4656
	2	0.9194	3.633	0.011	13 43.3	0 54.9	18 28.1	1 13.9	1.38584	1.30705	2.79	0.4451
	3	0.9221	3.644	0.014	13 48.8	0 55.3	17 31.3	1 10.1	1.38684	1.30744	2.65	0.4234
	4	0.9249	3.654	0.014	13 54.7	0 55.6	16 34.6	1 6.3	1.38823	1.30781	2.51	0.4004
h	5	0.9276	3.664	0.011	13 59.7	0 56.0	15 37.9	1 2.5	1.38994	1.30817	2.38	0.3759
(5.0)	6	0.9303	+3.674	−0.006	14 2.4	0 56.2	14 41.3	0 58.8	1.39192	1.30851	+2.24	+0.3498
	7	0.9331	3.685	+0.001	14 2.3	0 56.2	13 44.8	0 55.0	1.39400	1.30882	2.10	0.3220
	8	0.9358	3.695	0.008	13 59.3	0 56.0	12 48.3	0 51.2	1.39596	1.30912	1.96	0.2920
	9	0.9386	3.706	0.014	13 54.1	0 55.6	11 51.9	0 47.5	1.39766	1.30939	1.82	0.2597
	10	0.9413	3.716	0.017	13 48.1	0 55.2	10 55.6	0 43.7	1.39901	1.30966	1.68	0.2246
	11	0.9440	+3.727	+0.016	13 42.6	0 54.8	9 59.3	0 40.0	1.40002	1.30990	+1.54	+0.1863
	12	0.9468	3.737	0.013	13 38.9	0 54.6	9 3.0	0 36.2	1.40076	1.31011	1.39	0.1441
	13	0.9495	3.748	0.008	13 37.4	0 54.5	8 6.8	0 32.5	1.40137	1.31031	1.25	0.0972
	14	0.9522	3.759	+0.002	13 38.2	0 54.5	7 10.6	0 28.7	1.40198	1.31048	1.11	0.0444
	15	0.9550	3.769	−0.003	13 41.1	0 54.7	6 14.4	0 25.0	1.40272	1.31063	0.96	9.9842
	16	0.9577	+3.780	−0.006	13 44.8	0 55.0	5 18.3	0 21.2	1.40364	1.31077	+0.82	+9.9140
	17	0.9605	3.791	0.008	13 48.5	0 55.2	4 22.2	0 17.5	1.40479	1.31088	0.68	9.8301
	18	0.9632	3.802	0.008	13 51.5	0 55.4	3 26.1	0 13.7	1.40611	1.31097	0.53	9.7258
	19	0.9659	3.812	0.007	13 53.4	0 55.6	2 30.0	0 10.0	1.40757	1.31104	0.39	9.5880
h	20	0.9687	3.823	0.004	13 53.6	0 55.6	1 33.9	0 6.3	1.40910	1.31109	0.24	9.3848
(6.0)	21	0.9714	+3.834	−0.001	13 52.2	0 55.5	0 37.8	0 2.5	1.41066	1.31112	+0.10	+8.9899
	22	0.9741	3.845	+0.002	13 49.2	0 55.3	359 41.7	23 58.8	1.41215	1.31112	−0.05	−8.6739
	23	0.9769	3.855	0.005	13 44.8	0 55.0	358 45.6	23 55.0	1.41355	1.31110	0.19	9.2835
	24	0.9796	3.866	0.007	13 39.5	0 54.6	357 49.4	23 51.3	1.41479	1.31106	0.34	9.5275
	25	0.9824	3.877	0.007	13 33.8	0 54.2	356 53.3	23 47.6	1.41580	1.31100	0.48	9.6827
	26	0.9851	+3.888	+0.005	13 28.5	0 53.9	355 57.2	23 43.8	1.41662	1.31092	−0.63	−9.7967
	27	0.9878	3.899	+0.001	13 24.6	0 53.6	355 1.1	23 40.1	1.41726	1.31081	0.77	9.8868
	28	0.9906	3.909	−0.004	13 22.7	0 53.5	354 4.9	23 36.3	1.41781	1.31069	0.91	9.9613
	29	0.9933	3.920	0.009	13 23.0	0 53.5	353 8.6	23 32.6	1.41845	1.31054	1.06	0.0247
	30	0.9960	3.931	0.014	13 25.2	0 53.7	352 12.3	23 28.8	1.41925	1.31037	1.20	0.0799
	31	0.9988	+3.941	−0.015	13 28.4	0 53.9	351 16.0	23 25.1	1.42035	1.31017	−1.35	−0.1288
	32	1.0015	+3.952	−0.013	13 31.1	0 54.1	350 19.7	23 21.3	1.42179	1.30997	−1.49	−0.1728

FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.	Log A_1.	Log B_1.	Log C.	Log D.	f	G_1	H	Log g_1.	Log h.	Log i.
					s	° ′	° ′			
Jan. 0.72	+9.5263	+0.5259	−0.5124	+1.3045	+1.035	26 30	350 50	0.8765	1.3101	−0.1497
10.70	9.5690	0.5238	0.8107	1.2838	1.142	24 12	341 24	0.9109	1.3070	0.4480
20.67	9.6056	0.5146	0.9765	1.2473	1.242	22 2	331 49	0.9405	1.3022	0.6138
30.64	9.6365	0.5005	1.0856	1.1926	1.333	20 2	321 59	0.9656	1.2961	0.7229
Feb. 9.61	9.6624	0.4842	1.1614	1.1142	1.415	18 19	311 54	0.9870	1.2896	0.7986
19.59	+9.6840	+0.4692	−1.2138	+1.0020	+1.487	16 55	301 33	1.0052	1.2833	−0.8511
Mar. 1.56	9.7022	0.4591	1.2484	0.8316	1.550	15 55	290 57	1.0212	1.2781	0.8857
11.53	9.7180	0.4567	1.2678	+0.5233	1.608	15 17	280 13	1.0356	1.2748	0.9051
21.50	9.7324	0.4640	1.2736	−9.2851	1.662	15 3	269 25	1.0496	1.2737	0.9109
31.48	9.7463	0.4806	1.2664	0.5679	1.716	15 8	258 41	1.0636	1.2750	0.9037
Apr. 10.45	+9.7606	+0.5048	−1.2460	−0.8497	+1.773	15 28	248 8	1.0786	1.2785	−0.8833
20.42	9.7757	0.5339	1.2113	1.0098	1.836	15 57	237 50	1.0947	1.2836	0.8486
30.39	9.7920	0.5648	1.1599	1.1163	1.906	16 28	227 52	1.1122	1.2897	0.7972
May 10.37	9.8096	0.5948	1.0876	1.1911	1.985	16 55	218 14	1.1308	1.2960	0.7249
20.34	9.8283	0.6218	0.9861	1.2440	2.071	17 14	208 55	1.1502	1.3018	0.6234
30.31	+9.8476	+0.6443	−0.8371	−1.2799	+2.166	17 21	199 51	1.1698	1.3065	−0.4744
June 9.29	9.8672	0.6615	0.5889	1.3016	2.265	17 15	190 58	1.1892	1.3097	0.2262
19.26	9.8865	0.6730	−9.8960	1.3107	2.368	16 58	182 12	1.2078	1.3111	−9.5333
29.23	9.9051	0.6789	+0.3665	1.3078	2.472	16 30	173 28	1.2254	1.3106	+0.0038
July 9.20	9.9226	0.6794	0.7301	1.2926	2.573	15 54	164 41	1.2415	1.3083	0.3674
19.18	+9.9386	+0.6754	+0.9176	−1.2643	+2.670	15 13	155 46	1.2561	1.3043	+0.5549
29.15	9.9531	0.6678	1.0394	1.2209	2.761	14 30	146 39	1.2692	1.2991	0.6767
Aug. 8.12	9.9659	0.6581	1.1247	1.1590	2.843	13 48	137 16	1.2806	1.2931	0.7620
18.09	9.9770	0.6479	1.1859	1.0721	2.917	13 10	127 35	1.2906	1.2869	0.8232
28.07	9.9867	0.6393	1.2288	0.9467	2.982	12 38	117 34	1.2993	1.2812	0.8661
Sept. 7.04	+9.9952	+0.6342	+1.2566	−0.7500	+3.042	12 16	107 17	1.3072	1.2767	+0.8939
17.01	0.0029	0.6344	1.2711	−0.3470	3.096	12 3	96 47	1.3146	1.2742	0.9084
26.99	0.0102	0.6406	1.2729	+0.1002	3.148	12 2	86 9	1.3218	1.2738	0.9102
Oct. 6.96	0.0175	0.6529	1.2618	0.6743	3.201	12 10	75 30	1.3294	1.2759	0.8991
16.93	0.0251	0.6704	1.2370	0.9068	3.258	12 26	64 57	1.3374	1.2799	0.8743
26.90	+0.0336	+0.6914	+1.1966	+1.0489	+3.322	12 47	54 34	1.3465	1.2856	+0.8339
Nov. 5.88	0.0430	0.7138	1.1370	1.1459	3.394	13 10	44 25	1.3566	1.2920	0.7743
15.85	0.0533	0.7355	1.0517	1.2143	3.476	13 30	34 31	1.3675	1.2984	0.6890
25.82	0.0646	0.7549	0.9273	1.2619	3.568	13 44	24 50	1.3792	1.3040	0.5646
Dec. 5.79	0.0766	0.7704	0.7311	1.2925	3.667	13 51	15 21	1.3914	1.3083	0.3684
15.77	+0.0888	+0.7813	+0.3294	+1.3083	+3.772	13 48	6 0	1.4035	1.3107	+9.9667
25.74	0.1010	0.7871	−0.0755	1.3103	3.880	13 37	356 40	1.4154	1.3110	−9.7128
35.71	+0.1128	+0.7879	−0.6511	+1.2984	+3.986	13 17	347 18	1.4266	1.3092	−0.2884

$E = +0^{s}.003$

The above numbers give the same reductions from mean to apparent place as are employed in computing the apparent places of the fixed stars, given on pages 316 to 513, from the mean places, given on pages 217 to 230. In order to render exact interpolation possible through intervals of ten days, all short period terms have been omitted.

TERMS OF SHORT PERIOD IN THE NUTATION, 1919.

FOR WASHINGTON MEAN MIDNIGHT.

Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω
	″	″		″	″		″	″		″	″
Jan. 0	−0.04	−0.08	Feb. 15	+0.13	+0.08	Apr. 1	−0.19	+0.03	May 17	−0.02	−0.07
1	+0.04	0.07	16	+0.04	0.08	2	0.18	−0.01	18	+0.05	0.06
2	0.10	0.05	17	−0.05	0.07	3	0.13	0.05	19	0.09	−0.03
3	0.14	−0.01	18	0.12	0.05	4	−0.04	0.08	20	0.11	0.00
4	0.15	+0.03	19	0.17	+0.02	5	+0.07	0.10	21	0.09	+0.04
5	+0.10	+0.06	20	−0.20	−0.01	6	+0.18	−0.08	22	+0.04	+0.07
6	+0.03	0.08	21	0.19	0.04	7	0.25	0.05	23	−0.04	0.08
7	−0.06	0.07	22	0.16	0.06	8	0.28	−0.01	24	0.12	0.08
8	0.15	0.07	23	0.09	0.08	9	0.26	+0.03	25	0.19	0.06
9	0.20	+0.03	24	−0.02	0.08	10	0.20	0.06	26	0.23	+0.02
10	−0.20	−0.01	25	+0.05	−0.06	11	+0.11	+0.08	27	−0.21	−0.03
11	0.16	0.05	26	0.11	−0.03	12	+0.02	0.08	28	0.14	0.06
12	−0.07	0.08	27	0.14	0.00	13	−0.07	0.07	29	−0.03	0.09
13	+0.04	0.09	28	0.12	+0.04	14	0.13	0.04	30	+0.09	0.09
14	0.15	0.08	Mar. 1	+0.08	0.07	15	0.17	+0.01	31	0.19	0.07
15	+0.22	−0.05	2	0.00	+0.09	16	−0.19	−0.02	June 1	+0.26	−0.03
16	0.26	−0.01	3	−0.08	0.08	17	0.17	0.05	2	0.28	+0.01
17	0.24	+0.03	4	0.15	0.06	18	0.13	0.07	3	0.25	0.05
18	0.19	0.06	5	0.18	+0.02	19	0.07	0.08	4	0.19	0.07
19	0.11	0.08	6	0.17	−0.03	20	−0.01	0.07	5	0.10	0.08
20	+0.02	+0.08	7	−0.11	−0.06	21	+0.05	−0.05	6	+0.01	+0.08
21	−0.07	0.07	8	−0.01	0.09	22	0.10	−0.02	7	−0.08	0.06
22	0.14	0.04	9	+0.10	0.09	23	0.11	+0.01	8	0.13	+0.03
23	0.18	+0.01	10	0.19	0.07	24	0.08	0.05	9	0.16	0.00
24	0.20	−0.02	11	0.25	−0.03	25	+0.02	0.08	10	0.16	−0.03
25	−0.18	−0.05	12	+0.26	+0.01	26	−0.06	+0.09	11	−0.14	−0.06
26	0.14	0.07	13	0.23	0.04	27	0.14	0.07	12	0.09	0.07
27	−0.07	0.08	14	0.16	0.07	28	0.20	+0.04	13	−0.03	0.08
28	0.00	0.07	15	+0.07	0.08	29	0.21	0.00	14	+0.04	0.07
29	+0.08	0.06	16	−0.02	0.08	30	0.17	−0.04	15	0.09	0.04
30	+0.13	−0.02	17	−0.10	+0.06	May 1	−0.09	−0.07	16	+0.12	−0.01
31	0.15	+0.01	18	0.16	+0.03	2	+0.03	0.09	17	0.12	+0.03
Feb. 1	0.13	0.05	19	0.19	0.00	3	0.14	0.08	18	+0.07	0.06
2	+0.07	0.08	20	0.19	−0.03	4	0.23	0.06	19	0.00	0.08
3	−0.02	0.09	21	0.17	0.06	5	0.28	−0.02	20	−0.09	0.08
4	−0.11	+0.08	22	−0.12	−0.07	6	+0.28	+0.02	21	−0.17	+0.07
5	0.17	+0.04	23	−0.06	0.08	7	0.23	0.06	22	0.23	+0.03
6	0.19	0.00	24	+0.01	0.07	8	0.16	0.08	23	0.23	−0.01
7	0.16	−0.04	25	0.07	0.04	9	+0.06	0.08	24	0.18	0.05
8	−0.09	0.07	26	0.11	−0.01	10	−0.03	0.07	25	−0.09	0.08
9	+0.01	−0.09	27	+0.11	+0.03	11	−0.11	+0.05	26	+0.03	−0.09
10	0.12	0.08	28	0.08	0.06	12	0.15	+0.02	27	0.14	0.08
11	0.20	0.06	29	+0.01	0.08	13	0.17	−0.01	28	0.22	0.05
12	0.25	−0.02	30	−0.07	0.08	14	0.17	0.04	29	0.27	−0.01
13	0.25	+0.02	31	0.14	0.07	15	0.13	0.06	30	0.26	+0.03
14	+0.21	+0.05	Apr. 1	−0.19	+0.03	16	−0.08	−0.08	July 1	+0.20	+0.08
15	+0.13	+0.08	2	−0.18	−0.01	17	−0.02	−0.07	2	+0.12	+0.08

TERMS OF SHORT PERIOD IN THE NUTATION, 1919.

FOR WASHINGTON MEAN MIDNIGHT.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	″	″		″	″		″	″		″	″
July 1	+0.20	+0.06	Aug. 16	−0.21	+0.02	Oct. 1	+0.01	−0.07	Nov. 16	+0.09	+0.08
2	0.12	0.08	17	0.20	−0.02	2	0.07	0.05	17	0.00	0.07
3	+0.03	0.08	18	0.14	0.06	3	0.10	−0.02	18	−0.08	0.05
4	−0.05	0.06	19	−0.05	0.08	4	0.11	+0.01	19	0.13	+0.02
5	0.12	0.04	20	+0.06	0.09	5	0.08	0.05	20	0.15	−0.01
6	−0.15	+0.01	21	+0.16	−0.07	6	+0.02	+0.07	21	−0.14	−0.04
7	0.16	−0.02	22	0.23	−0.03	7	−0.05	0.08	22	0.11	0.06
8	0.14	0.05	23	0.25	+0.01	8	0.13	0.07	23	0.06	0.07
9	0.10	0.07	24	0.22	0.05	9	0.19	0.04	24	−0.01	0.07
10	−0.04	0.07	25	0.16	0.07	10	0.20	+0.01	25	+0.04	0.06
11	+0.02	−0.07	26	+0.07	+0.08	11	−0.17	−0.04	26	+0.09	−0.04
12	0.08	0.05	27	−0.02	0.08	12	−0.10	0.07	27	0.11	−0.01
13	0.12	−0.02	28	0.09	0.05	13	+0.01	0.09	28	0.09	+0.03
14	0.13	+0.01	29	0.14	+0.03	14	0.12	0.08	29	+0.05	0.06
15	0.10	0.05	30	0.16	−0.01	15	0.21	0.06	30	−0.02	0.08
16	+0.04	+0.07	31	−0.16	−0.03	16	+0.26	−0.02	Dec. 1	−0.11	+0.08
17	−0.05	0.08	Sept. 1	0.13	0.06	17	0.26	+0.02	2	0.18	0.06
18	0.13	0.07	2	0.08	0.07	18	0.22	0.06	3	0.23	+0.03
19	0.20	+0.04	3	−0.02	0.07	19	0.14	0.08	4	0.23	−0.01
20	0.22	0.00	4	+0.04	0.06	20	+0.05	0.08	5	0.19	0.05
21	−0.20	−0.04	5	+0.09	−0.04	21	−0.04	+0.07	6	−0.10	−0.08
22	0.12	0.07	6	0.12	−0.01	22	0.11	0.04	7	+0.02	0.09
23	−0.02	0.09	7	0.12	+0.03	23	0.15	+0.01	8	0.14	0.07
24	+0.09	0.08	8	0.08	0.06	24	0.16	−0.02	9	0.23	0.05
25	0.19	0.06	9	+0.02	0.08	25	0.14	0.04	10	0.27	−0.01
26	+0.24	−0.02	10	−0.07	+0.08	26	−0.11	−0.06	11	+0.26	+0.03
27	0.25	+0.02	11	0.14	0.06	27	−0.06	0.07	12	0.21	0.06
28	0.21	0.06	12	0.19	+0.03	28	0.00	0.07	13	0.13	0.08
29	0.14	0.08	13	0.20	−0.01	29	+0.05	0.05	14	+0.04	0.08
30	+0.05	0.08	14	0.15	0.05	30	0.09	−0.03	15	−0.04	0.06
31	−0.03	+0.07	15	−0.07	−0.08	31	+0.10	0.00	16	−0.10	+0.03
Aug. 1	0.10	0.05	16	+0.04	0.09	Nov. 1	0.08	+0.04	17	0.14	0.00
2	0.15	+0.02	17	0.14	0.07	2	+0.03	0.06	18	0.14	−0.03
3	0.16	−0.01	18	0.22	0.05	3	−0.04	0.08	19	0.11	0.05
4	0.15	0.04	19	0.26	−0.01	4	0.12	0.08	20	0.07	0.07
5	−0.12	−0.06	20	+0.24	+0.03	5	−0.19	+0.06	21	−0.01	−0.07
6	−0.06	0.07	21	0.19	0.06	6	0.22	+0.02	22	+0.04	0.06
7	0.00	0.07	22	0.10	0.08	7	0.20	−0.02	23	0.09	0.05
8	+0.06	0.06	23	+0.01	0.08	8	0.14	0.06	24	0.12	−0.02
9	0.11	−0.03	24	−0.07	0.06	9	−0.04	0.08	25	0.11	+0.02
10	+0.13	0.00	25	−0.13	+0.04	10	+0.08	−0.08	26	+0.08	+0.05
11	0.12	+0.04	26	0.16	0.00	11	0.19	0.07	27	+0.01	0.07
12	+0.07	0.07	27	0.16	−0.03	12	0.26	−0.03	28	−0.07	0.08
13	−0.01	0.08	28	0.14	0.05	13	0.28	+0.01	29	0.16	0.07
14	0.09	0.08	29	−0.10	0.07	14	0.25	0.05	30	0.22	0.04
15	−0.17	+0.06	30	−0.05	−0.07	15	+0.18	+0.07	31	−0.25	+0.01
16	*−0.21*	*+0.02*	*Oct. 1*	+0.01	−0.07	16	+0.09	+0.08	32	−0.22	−0.03

FOR JANUARY $0^{d}.701$, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
33 Piscium . . .	4.7	K0	0 1 11.398	+3.0714	−.0006	− 6 9 38.49	+20.136	+0.091
α Andromedæ (*Alpheratz*)	2.2	A0p	0 4 11.835	3.0968	+.0107	+28 38 35.75	19.879	−0.163
β Cassiopeiæ . .	2.4	F5	0 4 50.801	3.1872	+.0681	+58 42 11.00	19.860	−0.180
ε Phœnicis . . .	3.9	K0	0 5 18.189	3.0501	+.0096	−46 11 40.02	19.847	−0.198
22 Andromedæ . .	5.1	F0	0 6 6.340	3.1111	+.0021	+45 37 17.51	20.034	−0.004
γ Pegasi . . .	2.9	B2	0 9 3.767	+3.0869	+.0003	+14 43 59.89	+20.020	−0.010
σ Andromedæ . .	4.5	A2	0 14 5.508	3.1286	−.0044	+36 20 10.26	19.961	−0.047
ι Ceti	3.8	K0	0 15 18.072	3.0569	−.0013	− 9 16 22.23	19.971	−0.030
ζ Tucanæ . . .	4.3	F8	0 15 51.774	3.1450	+.2738	−65 21 1.61	21.169	+1.172
44 Piscium . . .	6.0	G5	0 21 14.985	3.0745	−.0014	+ 1 29 28.06	19.936	−0.023
β Hydri . . .	2.9	G0	0 21 31.014	+3.1942	+.6966	−77 42 37.54	+20.275	+0.318
α Phœnicis . . .	2.4	K0	0 22 17.060	2.9716	+.0188	−42 44 45.11	19.547	−0.403
12 Ceti	6.0	K5	0 25 54.320	3.0622	+.0011	− 4 24 16.81	19.917	0.000
13 Ceti . . . . †	5.2	G0	0 31 4.690	3.0872	+.0273	− 4 2 18.65	19.844	−0.017
ζ Cassiopeiæ . .	3.7	B2	0 32 27.051	3.3308	+.0036	+53 27 4.75	19.837	−0.007
π Andromedæ . .	4.4	B3	0 32 33.017	+3.1987	+.0019	+33 16 25.15	+19.844	0.000
ε Andromedæ . .	4.5	G5	0 34 16.283	3.1653	−.0172	+28 52 19.68	19.568	−0.254
δ Andromedæ . .	3.5	K0	0 34 59.554	3.2030	+.0110	+30 25 4.00	19.715	−0.097
α Cassiopeiæ (*Schedir*) . †	*var.*	K0	0 35 54.050	3.3892	+.0063	+56 5 35.94	19.768	−0.032
μ Phœnicis . . .	4.6	K0	0 37 29.961	2.8384	−.0046	−46 31 47.69	19.746	−0.032
β Ceti	2.2	K0	0 39 31.468	+3.0122	+.0160	−18 25 51.27	+19.789	+0.011
c Cassiopeiæ . .	4.7	B2	0 40 12.282	3.3331	+.0028	+47 50 28.75	19.731	−0.006
21 Cassiopeiæ . .	5.6	A2	0 40 16.332	3.9127	−.0050	+74 32 44.07	19.710	−0.026
ζ Andromedæ . .	4.3	K0	0 43 2.497	3.1735	−.0073	+23 49 36.37	19.614	−0.078
η Cassiopeiæ . . †	3.6	F8	0 44 11.422	3.6162	+.1433	+57 23 13.95	19.198	−0.476
δ Piscium . . .	4.6	K5	0 44 28.692	+3.1105	+.0055	+ 7 8 40.23	+19.625	−0.044
λ Hydri . . .	5.0	K5	0 45 47.458	2.0996	+.0125	−75 21 50.28	19.646	−0.001
20 Ceti	4.9	K0	0 48 52.004	3.0644	−.0005	− 1 35 1.29	19.588	−0.003
γ Cassiopeiæ . .	2.2	B0p	0 51 48.432	3.6009	+.0036	+60 16 42.30	19.530	−0.005
μ Andromedæ . .	3.9	A2	0 52 15.104	3.3224	+.0132	+38 3 36.91	19.556	+0.030
α Sculptoris . . .	4.4	B5	0 54 42.150	+2.8900	−.0018	−29 47 42.77	+19.464	−0.013
ε Piscium . . .	4.4	K0	0 58 44.253	3.1116	−.0054	+ 7 27 15.58	19.416	+0.026
β Phœnicis . . . †	3.4	K0	1 2 28.165	2.6791	−.0057	−47 9 9.49	19.281	−0.024
μ Cassiopeiæ . .	5.3	G5	1 2 52.150	3.9725	+.3919	+54 31 25.22	17.740	−1.556
η Ceti	3.6	K0	1 4 30.897	3.0175	+.0143	−10 36 40.39	19.131	−0.126
β Andromedæ . .	2.4	Ma	1 5 11.466	+3.3519	+.0148	+35 11 29.10	+19.123	−0.117
τ Piscium . . .	4.7	K0	1 7 11.687	3.2982	+.0056	+29 39 35.88	19.161	−0.029
ζ Piscium . . . †	5.6	A5	1 9 29.862	3.1323	+.0096	+ 7 8 50.53	19.079	−0.052
κ Tucanæ . . . †	5.0	F8	1 13 1.387	2.0388	+.0744	−69 18 23.02	19.125	+0.059
f Piscium . . .	5.3	A2	1 13 37.173	3.0929	−.0033	+ 3 11 17.64	18.994	−0.025
υ Piscium . . .	4.7	A2	1 15 0.602	+3.2917	+.0016	+26 50 19.32	+18.972	−0.008
θ Ceti	3.8	K0	1 19 58.440	2.9979	−.0057	− 8 36 3.43	18.622	−0.215
δ Cassiopeiæ . .	2.8	A5	1 20 30.250	3.9039	+.0407	+59 48 53.84	18.784	−0.037
γ Phœnicis . . .	3.4	K5	1 24 50.929	2.6072	−.0029	−43 43 59.31	18.462	−0.225
38 Cassiopeiæ . .	6.0	F5	1 25 10.654	4.4215	+.0263	+69 50 54.15	18.605	−0.072
η Piscium . . .	3.7	G5	1 27 8.748	+3.2064	+.0015	+14 55 43.29	+18.611	−0.003
40 Cassiopeiæ . .	5.5	K0	1 32 0.786	4.7408	−.0011	+72 37 40.60	18.450	−0.002
υ Andromedæ . .	4.2	G0	1 32 2.169	3.5116	−.0153	+41 0 3.03	18.074	−0.377
π Piscium . . .	5.6	F0	1 32 48.104	3.1771	−.0049	+11 43 39.27	18.459	+0.034
υ Persei . . .	3.8	K0	1 33 0.694	3.6695	+.0064	+48 13 5.87	18.297	−0.119
α Eridani (*Achernar*) .	0.6	B5	1 34 41.924	+2.2359	+.0103	−57 38 53.03	+18.317	−0.041
ω Cassiopeiæ . .	5.5	A0p	1 36 19.221	4.4067	+.0088	+67 38 2.41	18.299	−0.002
ν Piscium . . .	4.7	K0	1 37 12.857	3.1201	−.0015	+ 5 4 41.50	18.272	+0.003
φ Persei . . .	4.2	B0p	1 38 34.455	3.7465	+.0031	+50 16 52.51	18.204	−0.015
τ Ceti	3.6	K0	1 40 18.268	2.7866	−.1198	−16 21 48.80	19.015	+0.859
ο Piscium . . .	4.5	K0	1 41 6.847	+3.1654	+.0049	+ 8 45 1.80	+18.171	+0.045
ε Sculptoris . . . †	5.4	F0	1 41 50.899	+2.8044	+.0052	−25 27 24.73	+18.047	−0.051

13 Ceti, dup., $5^{m}.5$, $6^{m}.2$, 0″.3
α Cassiop., var. irreg., $2^{m}.2$, $2^{m}.8$
η Cassiop., comp. $7^{m}.6$, 4″ s. pr.
β Phœnicis, dup., $4^{m}.1$, $4^{m}.1$, 1″
ζ Piscium, star $6^{m}.5$, 24″ n. f.
κ Tucanæ, comp. 7^{m}. 6″ n.
ε Sculptoris, comp. 9^{m}, 5″ n. f.

MEAN PLACES OF TEN-DAY STARS, 1919.

FOR JANUARY 0^d.701, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
ζ Ceti	3.9	K0	1 47 27.704	+2.9602	+.0020	−10 44 4.71	+17.855	−0.027
α Trianguli	3.6	F5	1 48 27.574	3.4143	+.0015	+29 11 5.34	17.611	−0.231
ε Cassiopeiæ	3.4	B3	1 48 33.062	4.2885	+.0053	+63 16 18.86	17.824	−0.015
ξ Piscium	4.8	K0	1 49 21.630	3.1041	+.0015	+ 2 47 17.41	17.827	+0.021
β Arietis	2.7	A5	1 50 9.675	3.3091	+.0064	+20 24 45.37	17.663	−0.111
ψ Phœnicis	4.4	Mb	1 50 23.808	+2.4033	−.0124	−46 41 57.54	+17.660	−0.104
υ Ceti	4.2	K5	1 56 11.269	2.8257	+.0082	−21 28 11.09	17.515	−0.008
α Hydri	3.0	F0	1 56 12.608	1.8817	+.0276	−61 57 49.28	17.549	+0.026
50 Cassiopeiæ	4.1	A0	1 56 29.160	5.0687	−.0092	+72 1 48.57	17.531	+0.020
γ Andromedæ *pr.*	2.3	K0	1 58 55.208	3.6728	+.0046	+41 56 30.18	17.356	−0.051
γ Andromedæ *seq.*	5.1	A	Δα +0.842	....	...	Δδ + 4.57	....	...
α Arietis	2.2	K2	2 2 36.182	+3.3769	+.0139	+23 4 48.20	+17.101	−0.144
β Trianguli	3.1	A5	2 4 43.090	3.5627	+.0126	+34 36 17.20	17.105	−0.044
55 Cassiopeiæ	6.2	F5	2 8 6.296	4.6734	−.0020	+66 8 44.26	16.992	−0.002
6 Persei	5.4	K0	2 8 12.506	3.9757	+.0368	+50 41 24.91	16.823	−0.167
ξ¹ Ceti	4.5	G5	2 8 42.264	+3.1774	−.0012	+ 8 28 2.00	+16.950	−0.016
μ Fornacis	5.2	A0	2 9 20.182	2.6377	−.0037	−31 6 13.21	16.915	−0.022
γ Trianguli	4.1	A0	2 12 29.609	3.5596	+.0040	+33 28 23.70	16.736	−0.052
67 Ceti	5.7	G5	2 12 56.515	2.9908	+.0054	− 6 47 41.72	16.656	−0.110
φ Eridani	3.8	B8	2 13 36.838	2.1410	+.0062	−51 53 12.46	16.705	−0.029
ο Ceti (*Mira*) †	*var.*	Md	2 15 15.209	+3.0294	+.0002	− 3 20 40.97	+16.426	−0.229
κ Fornacis	5.4	F5	2 18 50.135	2.7447	+.0138	−24 11 2.49	16.401	−0.077
δ Hydri	4.3	A2	2 20 18.136	1.0595	−.0097	−69 1 39.63	16.425	+0.020
ι Cassiopeiæ †	4.6	A5p	2 22 22.323	4.9083	−.0003	+67 2 21.13	16.310	+0.016
ξ² Ceti	4.3	A0	2 23 50.991	3.1869	+.0025	+ 8 5 51.63	16.218	−0.007
σ Ceti	4.8	F5	2 28 14.799	+2.8416	−.0063	−15 35 57.66	+15.894	−0.102
36 H. Cassiopeiæ	5.3	K0	2 30 17.917	5.6466	−.0052	+72 27 54.51	15.904	+0.017
ν Ceti	5.0	G5	2 31 37.258	+3.1455	−.0025	+ 5 14 25.96	15.798	−0.018
μ Hydri	5.3	K0	2 33 21.032	−1.3413	+.0425	−79 27 46.74	15.685	−0.038
ν Arietis	5.4	A2	2 34 12.813	+3.4028	+.0001	+21 36 42.61	15.655	−0.021
δ Ceti	4.0	B2	2 35 19.754	+3.0735	+.0011	− 0 1 12.51	+15.619	+0.004
ε Hydri	4.3	B9	2 38 20.292	0.9152	+.0169	−68 36 49.84	15.454	+0.005
θ Persei	4.2	G0	2 38 39.530	4.0854	+.0353	+48 53 12.45	15.343	−0.088
γ Ceti *seq.* †	3.7	A0	2 39 6.089	3.1063	−.0096	+ 2 53 42.48	15.255	−0.151
π Ceti	4.4	B5	2 40 15.976	2.8539	−.0012	−14 12 3.85	15.329	−0.011
μ Ceti	4.4	A5	2 40 33.633	+3.2399	+.0188	+ 9 46 22.69	+15.299	−0.025
η Persei †	3.9	K0	2 44 46.664	4.3603	+.0041	+55 33 37.25	15.072	−0.012
41 Arietis	3.7	B8	2 45 12.683	3.5257	+.0050	+26 55 39.06	14.947	−0.111
β Fornacis	4.5	K0	2 45 42.041	2.5121	+.0080	−32 44 44.18	15.186	+0.156
σ Arietis	5.5	B5	2 47 1.045	3.3086	+.0016	+14 44 56.15	14.920	−0.034
τ² Eridani	4.8	K0	2 47 21.773	+2.7201	−.0014	−21 20 13.77	+14.917	−0.017
τ Persei	4.1	G0p	2 48 30.287	4.2388	+.0008	+52 25 55.17	14.863	−0.003
η Eridani	4.0	K0	2 52 28.190	2.9304	+.0060	− 9 13 11.26	14.419	−0.213
ε Arietis (*mean*) †	4.6	A2	2 54 34.587	3.4261	−.0009	+21 1 1.67	14.496	−0.010
θ Eridani †	3.4	A2	2 55 11.518	2.2767	−.0025	−40 37 43.35	14.492	+0.024
47 H. Cephei	5.7	Ma	2 55 15.335	+7.8671	−.0102	+79 6 1.49	+14.475	+0.010
α Ceti	2.8	Ma	2 58 2.590	3.1336	−.0009	+ 3 46 21.74	14.217	−0.078
τ³ Eridani	4.2	A3	2 58 49.235	2.6449	−.0104	−23 56 28.34	14.203	−0.044
γ Persei	3.1	G0p	2 58 55.196	4.3304	+.0010	+53 11 25.22	14.237	−0.004
ρ Persei †	*var.*	Mb	2 59 58.790	3.8366	+.0116	+38 31 38.07	14.060	−0.115
μ Horologii	5.2	F0	3 1 41.993	+1.4082	−.0123	−60 3 4.84	+14.015	−0.054
θ Hydri	5.5	B8	3 2 4.529	0.1030	+.0034	−72 13 7.57	14.059	+0.014
β Persei (*Algol*) †	*var.*	B8	3 2 53.513	3.8948	+.0008	+40 38 40.41	13.992	−0.002
δ Arietis	4.5	K0	3 6 59.641	3.4268	+.0110	+19 25 16.67	13.736	+0.001
12 Eridani †	4.0	F8	3 8 37.749	2.5468	+.0241	−29 18 20.91	14.267	+0.636
48 H. Cephei	5.5	F0	3 9 59.384	+7.5149	+.0204	+77 26 20.41	+13.488	−0.055
ζ Arietis	5.0	A0	3 10 14.519	+3.4443	−.0019	+20 44 42.16	+13.445	−0.082

ο Ceti, var., 331^d, $1^m.7$–$9^m.6$, star 9^m f. 8^s
ι Cassiop., triple, 7^m, 8^m, 2″, 8″
γ Ceti, comp. $6^m.2$, 2″.7 pr.

η Persei, star $8^m.5$, 28″ n. pr.
ε Arietis, dup., $5^m.2$, $5^m.6$, 1″.2
θ Eridani, comp. $4^m.4$, f. 8″.

ρ Persei, var. irreg., $3^m.4$–$4^m.2$
β Persei, var., $2^d.87$, $2^m.1$–$3^m.2$
12 Eridani, comp. 7^m, 1″.4 n. pr.

FOR JANUARY $0^d.701$, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.			Annual Variation.	Annual P. M.	Declination.			Annual Variation.	Annual P. M.
			h	m	s	s	s	°	′	″	″	″
38 G. Horologii †	5.7	N	3	10	29.823	+1.5151	−.0005	−57	37	28.59	+13.504	−0.006
ζ Eridani	4.9	A3	3	11	53.853	2.9126	−.0008	− 9	7	11.18	13.473	+0.053
τ Arietis	5.2	B3	3	16	32.848	3.4600	+.0023	+20	51	21.16	13.082	−0.033
e Eridani	4.3	G5	3	16	41.552	+2.3980	+.2808	−43	22	43.88	13.862	+0.756
ι Hydri	5.5	F2	3	17	56.939	−1.5460	+.0351	−77	41	5.55	13.062	+0.040
α Persei	1.9	F5	3	18	31.876	+4.2709	+.0030	+49	34	26.37	+12.955	−0.028
ο Tauri	3.8	G5	3	20	27.115	3.2259	−.0046	+ 8	44	40.90	12.781	−0.074
2 H. Camelopardalis	4.4	A0	3	22	29.918	4.8403	+.0027	+59	39	33.58	12.718	+0.001
ξ Tauri	3.8	B8	3	22	46.625	3.2489	+.0040	+ 9	27	3.61	12.651	−0.046
f Tauri	4.3	K0	3	26	23.923	3.3095	+.0016	+12	39	36.02	12.453	+0.002
ε Eridani †	3.8	K0p	3	29	6.792	+2.8254	−.0660	− 9	43	53.62	+12.291	+0.027
τ^5 Eridani	4.3	B8	3	30	12.499	2.6484	+.0023	−21	54	14.13	12.149	−0.039
δ Persei	3.1	B5	3	37	9.027	4.2616	+.0035	+47	31	47.01	11.664	−0.036
δ Eridani	3.7	K0	3	39	22.040	2.8732	−.0061	−10	2	13.01	12.274	+0.731
ν Persei	3.9	F5	3	39	41.113	4.0682	−.0004	+42	19	25.99	11.520	0.000
5 H. Camelopardalis	4.7	A0	3	41	47.039	+6.2904	+.0059	+71	5	3.18	+11.313	−0.057
η Tauri (*Alcyone*) †	3.0	B5	3	42	39.967	3.5623	+.0016	+23	51	20.24	11.256	−0.050
τ^6 Eridani	4.3	F8	3	43	21.756	2.5807	−.0115	−23	29	15.14	10.774	−0.481
g Eridani	4.2	K0	3	46	25.414	+2.2452	−.0036	−36	26	40.87	11.005	−0.028
γ Hydri	3.2	Ma	3	48	28.590	−0.9610	+.0097	−74	29	14.95	10.999	+0.117
ζ Persei	2.9	B1	3	49	2.169	+3.7664	+.0010	+31	38	38.89	+10.827	−0.014
9 H. Camelopardalis †	5.2	K0p	3	50	13.126	5.0969	+.0003	+60	52	22.62	10.737	−0.017
ε Persei †	3.0	B0	3	52	24.826	4.0203	+.0031	+39	46	37.36	10.565	−0.027
ξ Persei	4.0	Oe5	3	53	42.305	3.8878	+.0012	+35	33	32.63	10.478	−0.017
γ Eridani	3.2	K5	3	54	14.987	2.7986	+.0047	−13	44	17.23	10.344	−0.111
λ Tauri †	*var.*	B3	3	56	11.446	+3.3220	+.0002	+12	15	44.79	+10.298	−0.011
δ Reticuli	4.4	Ma	3	57	27.451	0.9416	−.0020	−61	37	41.95	10.212	−0.002
ν Tauri	3.9	A0	3	58	50.761	3.1900	+.0008	+ 5	45	55.73	10.104	−0.005
A Tauri †	4.5	K0	3	59	54.226	3.5439	+.0069	+21	51	41.91	9.972	−0.058
c Persei	4.0	B3p	4	2	46.541	4.3485	+.0042	+47	29	50.96	9.780	−0.032
p Tauri	5.6	F0	4	5	53.677	+3.6499	−.0024	+26	16	14.15	+ 9.531	−0.042
o^1 Eridani	4.1	F5	4	7	54.644	2.9275	+.0007	− 7	2	52.24	9.503	+0.086
μ Tauri	4.3	B3	4	11	8.056	3.2560	+.0016	+ 8	41	25.69	9.143	−0.024
α Horologii	3.8	K0	4	11	19.047	1.9875	+.0040	−42	29	37.85	8.923	−0.230
α Reticuli	3.4	G5	4	13	22.602	0.7658	+.0048	−62	40	34.93	9.037	+0.044
γ Tauri	3.9	K0	4	15	10.901	+3.4120	+.0083	+15	25	58.98	+ 8.825	−0.026
δ Tauri	3.9	K0	4	18	15.670	3.4574	+.0075	+17	21	12.87	8.579	−0.030
υ^5 Eridani	4.1	K5	4	20	59.644	+2.2530	+.0052	−34	12	15.70	8.435	+0.042
δ Mensæ	5.6	K0	4	23	24.703	−4.1364	+.0043	−80	24	17.28	8.272	+0.072
ε Tauri	3.6	K0	4	23	53.088	+3.5012	+.0082	+19	0	6.69	8.128	−0.034
m Persei †	6.1	F0	4	27	42.688	+4.2161	+.0012	+42	53	31.72	+ 7.859	+0.004
α Tauri (*Aldebaran*)	1.1	K5	4	31	16.239	3.4404	+.0047	+16	20	51.07	7.379	−0.189
α Doradus	3.5	A0p	4	32	14.699	1.2950	+.0067	−55	12	43.91	7.478	−0.011
ν Eridani	4.1	B2	4	32	16.223	2.9960	−.0005	− 3	31	1.44	7.487	0.000
53 Eridani	4.0	K0	4	34	28.138	2.7457	−.0061	−14	27	41.10	7.154	−0.154
τ Tauri	4.3	B5	4	37	22.890	+3.5991	+.0007	+22	48	9.45	+ 7.051	−0.020
Groombridge 848	6.0	F0	4	37	54.413	8.0267	+.0094	+75	47	45.95	6.884	−0.144
α Cœli	4.5	F2	4	37	56.985	1.9301	−.0149	−42	1	5.45	6.917	−0.106
4 Camelopardalis	5.4	A2	4	41	14.985	4.9882	+.0062	+56	36	53.56	6.605	−0.148
μ Eridani	4.2	B5	4	41	27.089	2.9990	+.0011	− 3	24	7.64	6.727	−0.009
π^3 Orionis	3.3	F8	4	45	26.492	+3.2554	+.0312	+ 6	49	15.62	+ 6.430	+0.023
9 Camelopardalis	4.4	B0	4	45	59.338	5.9508	+.0038	+66	12	25.02	6.366	+0.005
i Tauri	5.1	F0	4	46	38.026	3.5080	+.0059	+18	42	11.17	6.273	−0.035
π^5 Orionis	3.9	B3	4	50	1.877	3.1242	+.0002	+ 2	18	32.88	6.030	+0.005
ι Aurigæ	2.9	K2	4	51	42.964	3.9044	+.0009	+33	2	20.63	5.863	−0.021
ε Aurigæ †	*var.*	F5p	4	56	9.224	+4.3019	+.0012	+43	42	17.12	+ 5.499	−0.013
β Camelopardalis	4.2	G0	4	56	12.329	+5.3273	−.0004	+60	19	32.10	+ 5.497	−0.011

38 Horologii, remarkable purplish red star.

ε Eridani, comp. 9^m, s. 7″

η Tauri, quad., comps. $6^m.3$, $7^m.6$, $8^m.2$, 117″, 181″, 190″

9 H. Camelop., comp. 8^m, 1″.9 n. f.

ε Persei, comp. 8^m, 8″.6 n. f.

λ Tauri, var., $3^d.95$, $3^m.3$–$4^m.2$

A Tauri, star $6^m.5$ f. 38^s, 253″ s.

m Persei, star 7^m, 115″ s. pr.

ε Aurigæ, var. irreg., $3^m.0$–$4^m.5$

FOR JANUARY 0^d.701, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
ζ Aurigæ	3.9	K0p	4 56 48.782	+4.1902	+.0013	+40 57 32.32	+5.435	−0.022
ι Tauri	4.7	A5	4 58 15.176	3.5850	+.0056	+21 28 31.02	5.286	−0.049
11 Orionis	4.6	B9	4 59 56.357	3.4269	+.0013	+15 17 32.63	5.157	−0.036
η Aurigæ	3.3	B3	5 0 49.935	4.2048	+.0039	+41 7 34.42	5.046	−0.072
ε Leporis	3.3	K5	5 2 1.889	2.5385	+.0012	−22 28 44.32	4.953	−0.064
β Eridani	2.9	A2	5 3 52.046	+2.9493	−.0056	− 5 11 24.44	+4.786	−0.074
μ Aurigæ	4.8	A3	5 7 52.945	4.1022	−.0020	+38 23 23.39	4.440	−0.080
19 H. Camelopardalis	5.2	F8	5 9 10.862	9.8412	−.0275	+79 8 28.38	4.564	+0.155
μ Leporis	3.3	A0p	5 9 17.549	2.6941	+.0027	−16 18 1.71	4.371	−0.028
β Orionis (*Rigel*) †	0.3	B8p	5 10 38.656	2.8824	.0000	− 8 17 39.27	4.284	0.000
α Aurigæ (*Capella*)	0.2	G0	5 10 42.164	+4.4293	+.0086	+45 55 1.38	+3.850	−0.429
λ Aurigæ	4.8	G0	5 13 26.457	4.2181	+.0461	+40 1 42.40	3.384	−0.660
τ Orionis	3.7	B5	5 13 40.376	2.9127	−.0009	− 6 55 51.42	4.020	−0.005
ο Columbæ	4.9	K0	5 14 33.610	2.1589	+.0027	−34 58 26.15	3.597	−0.352
γ Orionis (*Bellatrix*)	1.7	B2	5 20 47.145	3.2171	−.0004	+ 6 16 38.37	3.396	−0.017
β Tauri	1.8	B8	5 21 10.218	+3.7916	+.0025	+28 32 24.94	+3.203	−0.177
17 Camelopardalis	5.8	K5	5 22 30.964	5.6609	+.0003	+63 0 4.74	3.257	−0.007
β Leporis	3.0	G0	5 24 46.481	2.5704	.0000	−20 49 23.22	2.980	−0.089
χ Aurigæ	4.9	B1	5 27 27.279	3.9042	+.0006	+32 7 59.98	2.824	−0.013
δ Orionis †	2.5	B0	5 27 52.066	3.0644	.0000	− 0 21 29.08	2.799	−0.002
Groombridge 966	6.4	K5	5 28 53.086	+8.0114	−.0002	+74 59 33.91	+2.730	+0.017
α Leporis	2.7	F0	5 29 9.448	2.6458	+.0003	−17 52 45.87	2.689	0.000
ϕ^1 Orionis	4.5	B0	5 30 22.364	3.2928	−.0002	+ 9 26 8.49	2.569	−0.015
ι Orionis †	2.9	Oe5	5 31 28.228	2.9343	+.0001	− 5 57 43.68	2.487	−0.002
ε Orionis	1.8	B0	5 32 6.163	3.0437	.0000	− 1 15 9.33	2.435	+0.001
ζ Tauri	3.0	B3	5 32 48.190	+3.5851	+.0006	+21 5 39.09	+2.341	−0.032
ζ Orionis †	2.0	B0	5 36 40.282	3.0271	+.0005	− 1 59 4.42	2.023	−0.014
α Columbæ	2.8	B5p	5 36 42.954	2.1726	+.0006	−34 7 0.00	1.995	−0.038
ο Aurigæ	5.5	A0	5 39 37.398	4.6455	−.0018	+49 47 31.94	1.761	−0.018
ζ Leporis	3.7	A2	5 43 17.080	2.7180	−.0013	−14 51 4.39	1.460	−0.001
κ Orionis	2.2	B0	5 43 54.876	+2.8450	+.0001	− 9 41 50.84	+1.402	−0.003
δ Doradus	4.5	A5	5 44 37.517	0.1025	−.0081	−65 45 57.32	1.343	−0.001
ν Aurigæ	4.2	K0	5 45 52.513	4.1575	−.0061	+39 7 34.19	1.248	+0.013
δ Leporis	3.9	K0	5 47 50.243	2.5797	+.0162	−20 53 6.28	0.414	−0.649
α Orionis (*Betelgeux*) †	*var.*	Ma	5 50 47.179	3.2480	+.0020	+ 7 23 34.96	0.815	+0.009
η Leporis	3.8	F5	5 52 42.926	+2.7324	−.0028	−14 10 53.70	+0.778	+0.141
δ Aurigæ	3.9	K0	5 52 51.520	4.9420	+.0118	+54 16 48.70	0.506	−0.118
β Aurigæ	2.1	A0p	5 53 35.268	4.4019	−.0038	+44 56 26.34	0.555	−0.006
θ Aurigæ †	2.7	A0p	5 54 11.868	4.0917	+.0047	+37 12 29.40	+0.417	−0.091
1 Geminorum	4.3	G5	5 59 11.800	3.6475	+.0002	+23 16 7.77	−0.039	−0.109
1 G. Puppis †	6.2	F8	6 2 8.534	+1.7259	−.0088	−45 2 9.72	+0.038	+0.225
ν Orionis	4.4	B2	6 2 56.863	3.4265	+.0012	+14 46 45.24	−0.253	−0.025
22 H. Camelopardalis	4.7	A0	6 9 55.461	6.6179	+.0026	+69 21 1.52	0.981	−0.114
η Geminorum †	*var.*	Ma	6 9 59.344	3.6227	−.0039	+22 31 53.15	0.890	−0.016
2 Lyncis	4.4	A0	6 12 28.801	5.2983	+.0012	+59 2 31.41	1.061	+0.030
ζ Canis Majoris	3.1	B3	6 17 12.133	+2.3019	−.0006	−30 1 37.07	−1.527	−0.023
μ Geminorum	3.2	Ma	6 18 3.648	3.6307	+.0046	+22 33 22.93	1.692	−0.114
ψ^1 Aurigæ	5.1	K2	6 18 39.790	4.6257	+.0029	+49 19 50.77	1.634	−0.004
β Canis Majoris	2.0	B1	6 19 7.938	2.6416	−.0006	−17 54 53.01	1.668	+0.004
8 Monocerotis †	4.5	A5	6 19 28.585	3.1802	−.0004	+ 4 38 6.17	1.692	+0.009
α Argus (*Canopus*)	−0.9	F0	6 22 9.229	+1.3319	+.0022	−52 39 3.89	−1.926	+0.009
10 Monocerotis	5.0	B3	6 23 57.646	2.9642	+.0010	− 4 42 39.69	2.086	+0.006
ν Geminorum	4.1	B5	6 24 9.231	3.5629	−.0005	+20 15 52.52	2.124	−0.016
8 Lyncis	6.0	G0	6 30 17.588	5.4913	−.0267	+61 33 15.02	2.918	−0.276
ξ^2 Canis Majoris	4.5	A0	6 31 39.717	2.5158	+.0023	−22 53 57.30	2.726	+0.035
23 H. Camelopardalis	5.6	F8	6 32 26.159	+10.2926	−.0281	+79 39 19.04	−3.460	−0.633
γ Geminorum	1.9	A0	6 33 1.997	+3.4670	+.0033	+16 28 10.22	−2.927	−0.048

β Orionis, comp. 8^m.0, 9″.5 s. pr.
δ Orionis, star 6^m.9, 52″.6 n.
ι Orionis, comp. 7^m.3, 11″.5 s. f.
ζ Orionis, comp. 4^m.2, 2″.4 s. f.
α Orionis, red star, var. irreg., 1^m.0–1^m.4
θ Aurigæ, comp. 7^m.5, 2″.5 n. pr.
1 Puppis, star 5^m.8, f. 12^s, 150″ s.
η Gem., var., 231^d.4, 3^m.2–4^m.2, comp. 8^m.8, 1″.2 n. pr.
8 Monoc., star 6^m.5, 13″.7 n. f.

FOR JANUARY 0^{d}.701, WASHINGTON MEAN TIME.

Name of Star.		Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
				h m s	s	s	° ′ ″	″	″
51 Aurigæ		5.7	K0	6 33 2.854	+4.1595	−.0020	+39 27 48.82	− 2.993	−0.113
ν Argus		3.2	B8	6 35 17.056	1.8367	+.0008	−43 7 27.75	3.093	−0.019
S Monocerotis	†	4.7	Oe5	6 36 31.054	3.3046	.0000	+ 9 58 18.15	3.189	−0.008
ε Geminorum		3.2	G5	6 38 56.975	3.6927	−.0001	+25 12 45.15	3.408	−0.018
ξ Geminorum		3.4	F5	6 40 44.633	3.3683	−.0076	+12 59 2.57	3.738	−0.193
ψ^5 Aurigæ		5.3	G0	6 40 54.280	+4.3295	+.0018	+43 39 33.91	− 3.399	+0.160
α Canis Majoris (*Sirius*)	†	−1.6	A0	6 41 34.720	2.6434	−.0373	−16 36 15.03	4.823	−1.206
18 Monocerotis		4.7	K0	6 43 38.219	3.1280	−.0020	+ 2 30 6.60	3.809	−0.016
43 Camelopardalis		5.1	B5	6 44 58.824	6.4865	+.0021	+68 59 4.44	3.897	+0.012
α Pictoris		3.3	A5	6 47 21.711	0.6174	−.0104	−61 51 15.66	3.875	+0.238
θ Geminorum		3.6	A2	6 47 27.161	+3.9579	+.0010	+34 3 36.69	− 4.171	−0.050
τ Argus		2.8	K0	6 47 55.561	1.4883	+.0025	−50 31 4.85	4.268	−0.107
15 Lyncis	†	4.5	K0	6 50 16.215	5.2058	+.0021	+58 31 50.18	4.492	−0.130
θ Canis Majoris		4.2	K2	6 50 25.623	2.7880	−.0091	−11 56 10.00	4.382	−0.007
ε Canis Majoris	†	1.6	B1	6 55 26.532	2.3575	−.0001	−28 51 39.69	4.799	+0.003
ζ Geminorum	†	*var.*	G0	6 59 18.369	+3.5604	−.0002	+20 41 24.79	− 5.137	−0.007
o^2 Canis Majoris		3.1	B5p	6 59 38.530	2.5049	−.0006	−23 42 50.58	5.153	+0.005
γ Canis Majoris		4.1	B5	7 0 5.649	2.7147	+.0003	−15 30 45.69	5.206	-0.010
δ Canis Majoris		2.0	F8	7 5 5.807	2.4382	−.0015	−26 15 49.59	5.614	+0.003
63 Aurigæ		5.1	K2	7 6 5.255	4.1323	+.0052	+39 27 14.30	5.703	−0.003
51 Geminorum		5.3	Mb	7 8 43.313	+3.4478	+.0019	+16 17 51.06	− 5.963	−0.042
γ^2 Volantis	†	3.9	K0	7 9 26.276	−0.5025	+.0004	−70 22 3.50	5.903	+0.078
λ Geminorum		3.6	A2	7 13 26.372	+3.4500	−.0029	+16 41 15.10	6.359	−0.045
π Argus		2.7	K5	7 14 16.918	2.1189	−.0008	−36 57 5.73	6.393	−0.010
δ Geminorum	†	3.5	F0	7 15 17.258	+3.5862	−.0010	+22 7 57.40	6.482	−0.015
δ Volantis		4.0	F5	7 16 52.918	−0.0204	+.0004	−67 48 32.55	− 6.605	−0.006
ι Geminorum		3.9	K0	7 20 41.898	+3.7300	−.0086	+27 57 36.81	7.001	−0.087
η Canis Majoris		2.4	B5p	7 20 53.518	2.3738	+.0003	−29 8 39.45	6.922	+0.007
Groombridge 1308		5.8	K0	7 22 28.056	6.2715	+.0018	+68 37 58.70	7.103	−0.045
β Canis Minoris		3.1	B8	7 22 45.560	3.2553	−.0032	+ 8 27 12.68	7.129	−0.047
ρ Geminorum		4.2	F0	7 23 54.241	+3.8626	+.0118	+31 56 48.96	− 6.993	+0.183
σ Argus	†	3.3	K5	7 26 39.604	1.9018	−.0072	−43 8 12.52	7.220	+0.180
α^2 Geminorum (*Castor*)		2.0	A0	7 29 26.068	3.8326	−.0144	+32 4 3.66	7.707	−0.082
α^1 Geminorum		2.8	A0	Δα − 0.245	. . . .	. . .	Δδ − 4.12	. . . .	. . .
25 Monocerotis		5.2	F5	7 33 15.027	2.9818	−.0066	− 3 55 44.77	7.911	+0.022
α Can. Min. (*Procyon*)	†	0.5	F5	7 35 3.760	+3.1419	−.0471	+ 5 26 0.15	− 9.115	−1.037
24 Lyncis		5.0	A2	7 36 9.762	5.0917	−.0042	+58 54 5.06	8.222	−0.056
κ Geminorum	†	3.7	G5	7 39 33.628	3.6261	−.0014	+24 35 35.71	8.497	−0.060
β Geminorum (*Pollux*)		1.2	K0	7 40 21.720	3.6752	−.0470	+28 13 22.53	8.555	−0.055
4 Puppis		5.1	F2	7 42 13.090	2.7636	−.0003	−14 21 57.88	8.649	−0.002
ξ Argus		3.5	G0	7 45 53.258	+2.5232	−.0004	−24 39 20.43	− 8.935	0.000
φ Geminorum		5.0	A2	7 48 32.587	3.0761	−.0020	+26 58 35.82	9.169	−0.027
26 Lyncis		5.7	K0	7 48 49.294	4.3801	−.0022	+47 46 33.06	9.170	−0.006
Groombridge 1374		5.6	K0	7 50 31.767	7.2366	−.0023	+74 8 10.85	9.334	−0.037
χ Argus		3.6	B3	7 54 43.195	1.5258	−.0043	−52 45 53.15	9.614	+0.006
ω Cancri		5.9	K0	7 56 1.942	+3.6334	+.0003	+25 36 56.00	− 9.725	−0.004
χ Geminorum		5.0	K0	7 58 32.819	3.6897	−.0012	+28 1 20.69	9.965	−0.053
27 Lyncis		4.9	A2	8 2 22.454	4.5282	−.0032	+51 44 29.40	10.204	−0.003
ρ Argus		2.9	F5	8 4 5.646	2.5547	−.0065	−24 4 11.74	10.279	+0.052
3 H. Ursæ Majoris		5.5	G5	8 4 46.259	6.0071	+.0002	+68 42 51.13	10.377	+0.005
γ Argus	†	2.2	Oap	8 7 2.246	+1.8498	−.0003	−47 5 50.89	−10.562	−0.011
ζ Cancri (*mean*)	†	4.7	G0	8 7 34.130	3.4441	+.0051	+17 53 35.32	10.719	−0.129
Bradley 1147		5.7	G5	8 9 24.306	7.6103	+.0077	+76 0 21.71	10.734	−0.008
20 Puppis		5.0	G5	8 9 36.588	2.7579	−.0009	−15 32 36.06	10.740	+0.001
β Cancri		3.8	K2	8 12 7.426	3.2554	−.0035	+ 9 26 9.98	10,979	−0.052
31 Lyncis		4.4	K5	8 17 17.895	+4.1196	+.0015	+43 26 56.90	−11.403	−0.100
d^1 Cancri		5.9	F0	8 18 43.693	+3.4386	−.0038	+18 35 35.44	−11.437	−0.031

S Monoc., comp. 8^{m}.8, 2″.9 s. pr.
15 Lyncis, dup., 4^{m}.9, 6^{m}.2, 0″.7
ε Can. Maj., comp. 9^{m}, 7″.8 s. f.
ζ Gem., var., 10^{d}.15, 3^{m}.7–4^{m}.3

γ^2 Volantis, comp. 5^{m}.8, 12″.9 n. pr.
δ Gem., comp. 8^{m}, 7″.0 s. pr.
σ Argus, star 8^{m}, 22″.4 n. f.
κ Gem., comp. 8^{m}.5, 6″.6 s. pr.

γ Argus, star 5^{m}, 42″.5 s. pr.
ζ Cancri, triple; binary 5^{m}.6, 6^{m}.3, 1″, with comp. 6^{m}.0, 5″.4 s. f.

Positions given for Sirius and Procyon are those of the centers of their orbits. Corrections given on page x remai to be applied to reduce *to the positions of the stars.*

FOR JANUARY $0^d.701$, WASHINGTON MEAN TIME.

Name of Star.		Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
				h m s	s	s	° ′ ″	″	″
ε Argus		1.7	K0p	8 20 51.181	+1.2334	−.0042	−59 14 54.66	−11.551	+0.008
30 Monocerotis		4.0	A0	8 21 36.867	+2.9995	−.0039	− 3 38 28.68	11.632	−0.020
θ Chamæleontis		4.3	K0	8 23 5.617	−1.7538	−.0451	−77 13 25.62	11.700	+0.018
ο Ursæ Majoris		3.5	G0	8 23 32.950	+5.0091	−.0160	+60 59 25.06	11.862	−0.112
Groombridge 1450		6.0	K0	8 27 39.352	3.9082	−.0082	+38 17 42.76	12.218	−0.179
η Cancri		5.5	K0	8 28 1.657	+3.4738	−.0025	+20 43 1.89	−12.120	−0.055
Groombridge 1446		6.3	K0	8 30 44.168	6.7360	−.0043	+73 54 51.78	12.371	−0.117
δ Hydræ		4.2	A0	8 33 22.176	3.1779	−.0048	+ 5 59 13.42	12.449	−0.014
σ Hydræ		4.5	K0	8 34 31.520	3.1380	−.0008	+ 3 37 36.15	12.527	−0.013
γ Cancri		4.7	A0	8 38 36.107	3.4763	−.0071	+21 45 38.51	12.834	−0.043
δ Cancri		4.2	K0	8 40 5.083	+3.4133	−.0009	+18 27 10.21	−13.130	−0.240
α Pyxidis		3.7	B2	8 40 20.206	2.4111	−.0003	−32 53 37.47	12.897	+0.011
ι Cancri	†	4.2	G5	8 41 48.010	3.6371	−.0006	+29 3 25.49	13.055	−0.051
δ Argus	†	2.0	A0	8 42 27.805	1.6516	−.0035	−54 24 40.77	13.149	−0.100
ε Hydræ	†	3.5	F8	8 42 29.300	3.1795	−.0127	+ 6 43 0.76	13.099	−0.048
σ^2 Cancri (*mean*)	†	5.5	K0	8 49 18.425	+3.6671	+.0034	+30 53 13.47	−13.519	−0.021
ζ Hydræ		3.3	K0	8 51 6.851	3.1741	−.0060	+ 6 15 16.60	13.607	+0.007
ι Ursæ Majoris		3.1	A5	8 53 40.201	4.1209	−.0435	+48 21 38.19	14.026	−0.248
α Cancri		4.3	A3	8 54 3.562	3.2842	+.0024	+12 10 19.25	13.844	−0.042
b^1 Carinæ	†	5.1	B3	8 54 59.435	1.4679	−.0034	−58 54 59.42	13.880	−0.019
κ Ursæ Majoris		3.7	A0	8 58 6.216	+4.1089	−.0027	+47 28 40.07	−14.123	−0.067
σ^2 Ursæ Majoris	†	4.9	F8	9 3 17.278	5.3168	−.0003	+67 27 52.65	14.442	−0.066
κ Cancri		5.1	B8	9 3 21.729	3.2523	−.0012	+10 59 41.70	14.393	−0.013
λ Argus		2.2	K5	9 5 0.963	2.2064	−.0015	−43 6 18.77	14.487	−0.007
θ Hydræ		3.8	A0	9 10 9.107	3.1234	+.0088	+ 2 39 24.36	15.100	−0.312
β Argus		1.8	A0	9 12 19.002	+0.6685	−.0310	−69 23 0.47	−14.821	+0.094
83 Cancri		6.6	F5	9 14 27.838	3.3531	−.0076	+18 2 57.98	15.176	−0.136
ι Argus		2.2	F0	9 14 55.198	1.6040	−.0055	−58 56 5.68	15.060	+0.006
40 Lyncis		3.3	K5	9 16 7.530	3.6624	−.0178	+34 44 9.16	15.123	+0.012
θ Pyxidis		4.9	Ma	9 17 54.186	2.6515	−.0048	−25 37 13.95	15.269	−0.032
α Hydræ		2.2	K2	9 23 36.448	+2.9486	−.0010	− 8 18 24.48	−15.523	+0.033
h Ursæ Majoris		3.8	F0	9 25 9.712	4.7611	+.0183	+63 25 1.11	15.618	+0.024
d Ursæ Majoris		4.6	G0	9 27 20.888	5.3535	−.0112	+70 11 14.68	15.690	+0.071
θ Ursæ Majoris		3.3	F8	9 27 26.972	4.0282	−.1026	+52 2 50.49	16.309	−0.543
ψ Argus	†	3.6	F5	9 27 30.401	2.3596	−.0181	−40 6 42.94	15.731	+0.038
ξ Leonis		5.1	G5	9 27 34.920	+3.2365	−.0063	+11 39 33.18	−15.857	−0.084
10 Leonis Minoris		4.6	G5	9 29 16.020	3.6839	+.0011	+36 45 28.79	15.885	−0.021
ο Leonis		3.8	F5p	9 36 49.779	3.2046	−.0096	+10 15 41.67	16.292	−0.033
θ Antliæ		5.0	F5	9 40 35.426	2.6733	−.0036	−27 23 53.09	16.421	+0.029
ε Leonis		3.1	G0p	9 41 15.414	3.4102	−.0034	+24 8 52.02	16.505	−0.022
υ Argus	†	3.2	F0	9 45 4.691	+1.5006	−.0025	−64 41 46.09	−16.688	−0.017
υ Ursæ Majoris		3.9	F0	9 45 14.613	4.2889	−.0382	+59 25 13.85	16.836	−0.157
6 Sextantis		6.0	A3	9 47 9.185	3.0244	+.0011	− 3 51 47.18	16.799	−0.028
μ Leonis		4.1	K0	9 48 9.588	3.4163	−.0171	+26 23 20.77	16.873	−0.054
Groombridge 1586		6.0	K0	9 51 10.444	5.4218	−.0197	+73 15 55.72	17.021	−0.060
19 Leonis Minoris		5.2	F5	9 52 43.766	+3.6836	−.0111	+41 26 31.54	−17.055	−0.022
φ Argus		3.7	B5	9 54 0.964	2.1020	−.0033	−54 10 55.33	17.113	−0.020
π Leonis		4.9	Ma	9 55 56.064	3.1719	−.0029	+ 8 26 0.29	17.206	−0.027
η Leonis		3.6	A0p	10 2 55.041	3.2722	−.0022	+17 9 29.56	17.491	−0.004
α Leonis (*Regulus*)		1.3	B8	10 4 3.617	3.1978	−.0169	+12 21 48.93	17.536	−0.002
λ Hydræ		3.8	K0	10 6 38.353	+2.9247	−.0137	−11 57 11.34	−17.730	−0.088
q Velorum		4.1	A2	10 11 19.913	2.5134	−.0153	−41 43 12.88	17.802	+0.032
32 Ursæ Majoris		5.7	A3	10 12 10.218	4.3888	−.0140	+65 30 47.09	17.879	−0.012
ζ Leonis		3.6	F0	10 12 11.322	3.3415	+.0014	+23 49 17.39	17.877	−0.009
λ Ursæ Majoris		3.5	A0	10 12 13.157	3.6295	−.0142	+43 19 10.15	17.907	−0.038
γ Leonis *pr.*	†	2.6	K0	10 15 30.561	+3.3110	+.0212	+20 15 6.41	−18.149	−0.152
μ Ursæ Majoris		3.2	K5	10 17 30.616	+3.5845	−.0068	+41 54 26.65	−18.047	+0.027

ι Cancri, star $6^m.6$, 30″.6 n. pr.
δ Argus, comp. 5^m, 2″ s.
ε Hydræ, triple; binary $3^m.5$, $6^m.8$, with comp. $7^m.8$, 3″.3

σ^2 Cancri, dup., $5^m.9$, $6^m.4$, 1″.4
b^1 Carinæ, comp. $7^m.2$, 5^s f.
σ^2 Urs. Maj., binary, $4^m.9$, 8^m, 1″.3

ψ Argus, dup., $3^m.8$, $6^m.0$, 0″.8
υ Argus, comp. $6^m.0$, 4″.9 s. f.
γ Leonis, comp. $3^m.8$, 3″.7 s. f.

FOR JANUARY 0^d.701, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
30 H. Ursæ Majoris	4.9	A0	10 18 18.879	+4.3574	−.0024	+65 58 35.99	−18.122	−0.018
μ Hydræ	4.1	K5	10 22 10.338	2.9007	−.0089	−16 25 20.32	18.326	−0.079
31 Leonis Minoris	4.4	K0	10 23 12.334	3.4780	−.0094	+37 7 21.62	18.396	−0.112
α Antliæ	4.4	K5	10 23 26.600	2.7428	−.0060	−30 39 19.18	18.315	−0.023
36 Ursæ Majoris	4.8	F5	10 25 27.290	3.8582	−.0208	+56 23 46.95	18.403	−0.039
9 H. Draconis	5.0	G5	10 28 15.102	+5.1738	−.0084	+76 7 51.11	−18.470	−0.009
ρ Leonis	3.8	B0p	10 28 32.882	3.1613	−.0004	+ 9 43 25.99	18.474	−0.003
33 Sextantis	6.4	K0	10 37 16.940	3.0518	−.0100	− 1 18 54.52	18.864	−0.110
41 Leonis Minoris	5.0	A2	10 39 0.909	3.2664	−.0084	+23 36 46.33	18.797	+0.009
θ Argus	3.0	B0	10 40 3.754	2.1332	−.0043	−63 58 13.43	18.865	−0.027
42 Leonis Minoris	5.4	B9	10 41 21.897	+3.3416	−.0024	+31 6 33.50	−18.918	−0.041
η Argus †	*var.*	Pec.	10 41 54.877	2.3217	−.0002	−59 15 30.38	18.902	−0.009
μ Argus †	2.8	G5	10 43 16.907	2.5744	+.0066	−48 59 31.96	19.014	−0.081
l Leonis	5.3	A0	10 45 0.099	3.1561	+.0001	+10 58 26.64	19.015	−0.033
δ^2 Chamæleontis †	4.6	B3	10 45 2.198	0.5901	−.0192	−80 6 46.61	18.986	−0.004
ν Hydræ	3.3	Ma	10 45 37.607	+2.9584	+.0061	−15 46 9.24	−18.788	+0.211
46 Leonis Minoris	3.9	K0	10 48 47.199	3.3625	+.0074	+34 39 6.97	19.368	−0.283
54 Leonis †	4.5	A0	10 51 13.823	3.2524	−.0060	+25 10 55.59	19.167	−0.018
ι Antliæ	4.7	K0	10 52 56.700	2.7966	+.0112	−36 42 7.54	19.331	−0.138
Groombridge 1706	6.3	G5	10 53 31.007	4.8767	−.0264	+78 12 16.06	19.243	−0.035
α Crateris	4.2	K0	10 55 49.578	+2.9209	−.0327	−17 52 2.57	−19.157	+0.108
d Leonis	5.0	K0	10 56 22.678	3.0990	+.0004	+ 4 3 9.49	19.300	−0.022
β Ursæ Majoris	2.4	A0	10 56 57.873	3.6382	+.0105	+56 49 0.82	19.266	+0.026
α Ursæ Majoris	2.0	K0	10 58 44.585	3.7254	−.0164	+62 11 18.89	19.404	−0.071
χ Leonis	4.7	F0	11 0 50.397	3.0959	−.0234	+ 7 46 27.54	19.422	−0.041
p^4 Leonis	5.7	K0	11 2 46.368	+3.0612	−.0253	+ 2 23 44.26	−19.504	−0.080
ψ Ursæ Majoris	3.2	K0	11 5 7.006	3.3837	−.0053	+44 56 17.80	19.506	−0.033
β Crateris	4.5	A2	11 7 40.321	2.9480	.0000	−22 23 0.66	19.631	−0.106
δ Leonis	2.6	A2	11 9 48.213	3.1947	+.0108	+20 58 3.59	19.707	−0.141
θ Leonis	3.4	A0	11 9 59.460	3.1501	−.0049	+15 52 21.01	19.655	−0.085
ν Ursæ Majoris	3.7	K0	11 14 6.492	+3.2471	−.0018	+33 32 11.51	−19.618	+0.026
δ Crateris	3.8	K0	11 15 17.371	2.9977	−.0088	−14 20 24.13	19.470	+0.195
σ Leonis	4.1	A0	11 16 57.650	3.0948	−.0062	+ 6 28 24.68	19.705	−0.013
π Centauri	4.3	B5	11 17 18.453	2.7274	−.0041	−54 2 49.08	19.711	−0.013
ι Leonis †	4.0	F5	11 19 42.148	3.1284	+.0103	+10 58 32.03	19.819	−0.083
τ Leonis	5.2	K0	11 23 46.327	+3.0857	+.0008	+ 3 18 9.05	−19.812	−0.016
λ Draconis	4.1	Ma	11 26 36.816	3.5921	−.0072	+69 46 41.85	19.854	−0.021
ξ Hydræ	3.7	G5	11 29 0.898	2.9469	−.0158	−31 24 33.85	19.917	−0.055
λ Centauri	3.3	B9	11 32 2.145	2.7520	−.0073	−62 34 17.72	19.923	−0.027
υ Leonis	4.5	K0	11 32 48.085	3.0716	.0000	− 0 22 35.07	19.865	+0.039
π Chamæleontis	5.7	F0	11 33 54.643	+2.4556	−.0323	−75 26 53.34	−19.938	−0.023
3 Draconis	5.5	K0	11 37 58.134	3.3698	−.0080	+67 11 35.76	19.918	+0.035
ζ Crateris	4.9	G5	11 40 39.305	3.0381	+.0018	−17 54 1.32	20.015	−0.041
χ Ursæ Majoris	3.8	K0	11 41 46.807	3.1787	−.0128	+48 13 42.81	19.962	+0.020
β Leonis (*Denebola*)	2.2	A2	11 44 55.777	3.0621	−.0341	+15 1 29.68	20.120	−0.118
β Virginis	3.8	F8	11 46 28.561	+3.1252	+.0494	+ 2 13 16.59	−20.285	−0.275
Groombridge 1830	6.5	G5	11 48 18.943	3.4665	+.3400	+38 18 0.49	25.803	−5.784
γ Ursæ Majoris	2.5	A0	11 49 34.690	3.1683	+.0115	+54 8 42.43	20.020	+0.004
π Virginis	4.6	A3	11 56 43.329	3.0742	−.0009	+ 7 3 57.57	20.075	−0.032
ο Virginis	4.2	G5	12 1 5.021	3.0569	−.0148	+ 9 10 57.92	20.013	+0.032
δ Centauri	2.9	B3p	12 4 9.180	+3.0968	−.0050	−50 16 17.34	−20.072	−0.030
ε Corvi	3.2	K0	12 5 57.370	3.0818	−.0051	−22 10 9.67	20.036	+0.003
4 H. Draconis	5.1	A5	12 8 25.338	2.8430	+.0026	+78 3 58.69	20.012	+0.019
δ Crucis	3.1	B3	12 10 50.417	3.1771	+.0021	−58 17 55.45	20.061	−0.038
δ Ursæ Majoris	3.4	A2	12 11 25.585	2.9832	+.0150	+57 28 57.47	20.015	+0.005
γ Corvi	2.8	B8	12 11 38.269	+3.0821	−.0114	−17 5 31.84	−20.003	+0.017
2 Canum Venaticorum †	5.8	K5	12 12 4.386	+3.0151	+.0038	+41 6 39.14	−20.063	−0.046

η Argus, var. irreg., 1^m.6–6^m.6
μ Argus, comp. 7^m, 2″.2 n. f.
δ^2 Cham., star 5^m.5 pr. 32^s, 256″ n.
54 Leonis, comp. 6^m.3, 6″.4 s. f.
ι Leonis, comp. 6^m.8, 2″.6 n. f.
2 Can. Ven., star 8^m, 11″.6 s. pr.

MEAN PLACES OF TEN-DAY STARS, 1919.

FOR JANUARY 0^d.701, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
β Chamæleontis . .	4.4	B5	12 13 33.732	+3.4553	−.0188	−78 51 44.92	−19.993	+0.017
η Virginis . . .	4.0	A0	12 15 45.707	3.0695	−.0036	− 0 13 0.36	20.025	−0.027
α¹ Crucis . . .	1.6	B1	12 22 4.810	3.3148	−.0064	−62 39 1.41	19.992	−0.039
α² Crucis . . .	2.1		Δα + 0.625	. . . .	. . .	Δδ − 1.84	. . . .	. . .
20 Comæ . . .	5.7	A2	12 25 39.253	3.0180	+.0036	+21 20 40.27	19.956	−0.036
δ Corvi . . . †	3.1	A0	12 25 40.268	+3.1017	−.0140	−16 3 52.62	−20.068	−0.149
γ Crucis . . . †	1.6	Mb	12 26 39.638	3.3057	−.0028	−56 39 34.58	20.170	−0.261
8 Canum Venaticorum	4.3	G0	12 29 54.050	2.8556	−.0617	+41 47 50.62	19.596	+0.279
κ Draconis . . .	3.9	B5p	12 30 2.077	2.5755	−.0112	+70 14 4.53	19.863	+0.010
β Corvi . . .	2.8	G5	12 30 7.697	3.1461	−.0008	−22 56 56.27	19.934	−0.061
24 Comæ *seq.* . . †	5.2	K0	12 31 4.052	+3.0104	−.0007	+18 49 21.81	−19.848	+0.013
α Muscæ . . .	2.9	B3	12 32 20.162	3.5456	−.0088	−68 41 21.93	19.875	−0.029
χ Virginis . . .	4.8	K0	12 35 3.824	3.0940	−.0056	− 7 33 0.02	19.842	−0.031
γ Centauri . . . †	2.4	A0	12 37 2.544	3.2963	−.0196	−48 30 54.69	19.803	−0.020
γ Virginis (*mean*) . †	2.9	F0	12 37 33.369	3.0400	−.0365	− 1 0 19.17	19.773	+0.004
ρ Virginis . . .	5.0	A0	12 37 47.123	+3.0372	+.0058	+10 40 54.12	−19.880	−0.107
76 Ursæ Majoris . .	5.9	A0	12 38 1.913	2.6299	−.0065	+63 9 27.31	19.788	−0.018
β Crucis . . .	1.5	B1	12 42 58.614	3.4849	−.0064	−59 14 46.59	19.727	−0.033
31 Comæ . . .	5.1	G0	12 47 45.254	2.9236	−.0022	+27 58 52.25	19.636	−0.024
n Centauri . . .	4.3	A5	12 48 56.689	3.3141	+.0060	−39 44 19.02	19.625	−0.035
ε Ursæ Majoris (*Alioth*)	1.7	A0p	12 50 28.231	+2.6471	+.0138	+56 23 57.31	−19.574	−0.013
δ Virginis . . .	3.7	Ma	12 51 31.350	3.0209	−.0318	+ 3 50 14.59	19.601	−0.060
α Canum Venat. *seq.* . †	2.9	A0p	12 52 14.477	2.8100	−.0203	+38 45 20.03	19.478	+0.049
δ Muscæ . . .	3.6	K2	12 56 40.410	4.0784	+.0497	−71 6 44.10	19.466	−0.031
ε Virginis . . .	3.0	K0	12 58 8.687	2.9865	−.0186	+11 23 39.18	19.389	+0.015
θ Virginis . . . †	4.4	A0	13 5 45.242	+3.1035	−.0029	− 5 6 24.79	−19.266	−0.040
43 Comæ . . .	4.3	G0	13 8 5.723	2.8022	−.0599	+28 17 18.47	18.288	+0.879
20 Canum Venaticorum .	4.7	F0	13 13 54.838	2.6951	−.0094	+40 59 55.61	18.997	+0.015
γ Hydræ . . .	3.3	G5	13 14 30.850	3.2562	+.0046	−22 44 40.30	19.048	−0.053
ι Centauri . . .	2.9	A2	13 16 2.190	3.3629	−.0294	−36 17 7.50	19.049	−0.097
ζ¹ Ursæ Maj. (*Mizar*) . †	2.4	A0p	13 20 40.092	+2.4214	+.0153	+55 20 52.99	−18.845	−0.030
ζ² Ursæ Majoris . .	4.0	A0	Δα + 0.917	. . . .	. . .	Δδ −12.41	. . . .	. . .
α Virginis (*Spica*) .	1.2	B2	13 20 55.405	3.1575	−.0028	−10 44 19.88	18.841	−0.032
Groombridge 2001 .	6.1	K5	13 24 3.964	1.5246	+.0012	+72 48 42.44	18.730	−0.019
70 Virginis . . .	5.2	G5	13 24 28.095	2.9340	−.0168	+14 12 39.66	19.283	−0.554
ζ Virginis . . .	3.4	A2	13 30 33.844	+3.0548	−.0195	− 0 10 55.69	−18.461	+0.040
17 H. Canum Venaticorum	5.0	F0	13 31 10.935	2.6813	+.0073	+37 35 49.58	18.484	−0.004
ε Centauri . . .	2.6	B1	13 34 44.693	3.7826	−.0039	−53 3 18.70	18.396	−0.039
m Virginis . . .	5.2	Ma	13 37 21.492	3.1456	−.0073	− 8 17 41.03	18.231	+0.032
τ Boötis . . .	4.5	F5	13 43 24.772	2.8508	−.0341	+17 51 35.76	18.013	+0.026
η Ursæ Majoris (*Alkaid*)	1.9	B3	13 44 21.076	+2.3676	−.0118	+49 43 4.52	−18.026	−0.023
89 Virginis . . .	5.1	K0	13 45 27.996	3.2547	−.0077	−17 43 52.12	18.000	−0.040
ζ Centauri . . .	3.1	B2p	13 50 28.678	3.7275	−.0070	−46 53 25.05	17.825	−0.064
η Boötis . . .	2.8	G0	13 50 49.681	2.8567	−.0044	+18 48 11.75	18.110	−0.363
θ Apodis . . . †	*var.*	Mb	13 57 23.197	5.7520	−.0293	−76 24 23.83	17.502	−0.029
11 Boötis . . .	6.1	A3	13 57 30.172	+2.7214	−.0060	+27 46 38.10	−17.463	+0.005
τ Virginis . . .	4.3	A2	13 57 31.371	3.0516	+.0010	+ 1 56 9.56	17.496	−0.029
β Centauri . . .	0.9	B1	13 58 5.649	4.2092	−.0033	−59 58 58.48	17.475	−0.033
π Hydræ . . .	3.5	K0	14 1 45.264	3.4103	+.0031	−26 17 34.04	17.429	−0.116
θ Centauri . . .	2.3	K0	14 1 54.559	3.5209	−.0437	−35 58 19.44	17.800	−0.525
α Draconis . . .	3.6	A0	14 2 11.802	+1.6246	−.0071	+64 45 45.51	−17.252	+0.011
d Boötis . . .	4.8	F5	14 6 42.338	2.7370	−.0014	+25 28 29.02	17.137	−0.078
κ Virginis . . .	4.3	K0	14 8 34.350	+3.1973	+.0006	− 9 53 50.27	16.840	+0.132
4 Ursæ Minoris . .	5.0	K0	14 9 8.497	−0.2756	−.0108	+77 55 41.04	16.921	+0.026
ι Virginis . . .	4.2	F5	14 11 45.878	+3.1429	−.0013	− 5 36 52.32	17.250	−0.427
α Boötis (*Arcturus*) .	0.2	K0	14 11 57.972	+2.7356	−.0779	+19 36 12.75	−18.816	−2.004
λ Boötis . . .	4.3	A0	14 13 18.371	+2.2829	−.0172	+46 27 35.07	−16.598	+0.151

δ Corvi, star 8^m, 24″.4 s. pr.
γ Crucis, star 6^m.6, 85″ n. f.
24 Comæ, star 6^m.7, 20″.6 pr.
γ Cent., dup., 3^m.1, 3^m.1, 1″.7

γ Virginis, binary, 3^m.7, 3^m.7, 6″.4, P=324°
α Can. Ven., star 5^m, 19″.8 s. pr.
θ Virginis, comp. 9^m, 7″.1 n. pr.

ζ¹ Urs. Maj., star Alcor 4^m.0, f. 79°.0, 222″ n.
θ Apodis, var. irreg., 5^m.5–6^m.6

FOR JANUARY $0^{d}.701$, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
λ Virginis	4.6	A2	14 14 43.394	+3.2414	–.0024	–12 59 56.03	–16.660	+0.021
2 Libræ	6.3	K0	14 19 3.926	3.2242	–.0014	–11 20 40.97	16.533	–0.067
θ Boötis	4.1	F8	14 22 26.416	2.0433	–.0254	+52 13 28.79	16.702	–0.405
f Boötis	5.4	A5	14 22 41.283	2.7902	–.0052	+19 35 25.57	16.270	+0.015
φ Virginis †	5.0	K0	14 24 1.637	+3.0893	–.0090	– 1 51 55.59	16.220	–0.004
5 Ursæ Minoris	4.4	K2	14 27 40.660	–0.1581	+.0022	+76 3 22.13	–16.004	+0.021
ρ Boötis	3.8	K0	14 28 20.381	+2.5864	–.0073	+30 43 34.97	15.877	+0.113
γ Boötis	3.0	F0	14 28 49.034	2.4171	–.0091	+38 39 43.26	15.821	+0.145
η Centauri	2.6	B3p	14 30 21.420	3.7984	–.0032	–41 48 9.76	15.916	–0.032
σ Boötis	4.5	F0	14 31 9.262	2.6131	+.0150	+30 5 47.16	15.716	+0.125
α Centauri †	0.1	G0	14 34 5.166	+4.0576	–.4863	–60 30 6.63	–14.960	+0.722
33 Boötis	5.4	A0	14 35 49.437	2.2341	–.0056	+44 45 12.27	15.631	–0.043
α Apodis	3.8	K5	14 37 43.585	7.3126	–.0088	–78 42 8.50	15.506	–0.024
μ Virginis	4.0	F5	14 38 47.368	3.1591	+.0071	– 5 18 24.29	15.745	–0.322
ε Boötis †	2.7	K0p	14 41 26.975	2.6203	–.0035	+27 24 54.04	15.264	+0.009
109 Virginis	3.8	A0	14 42 9.149	+3.0314	–.0074	+ 2 14 0.63	–15.269	–0.035
8 Libræ	5.3	F5	14 46 12.189	3.3139	–.0073	–15 39 40.19	15.075	–0.074
α Libræ	2.9	A2	14 46 23.636	3.3144	–.0078	–15 42 21.34	15.067	–0.077
Groombridge 2164	5.7	K2	14 49 22.965	+1.5205	–.0165	+59 37 21.82	14.698	+0.118
β Ursæ Minoris	2.2	K5	14 50 55.657	–0.2007	–.0065	+74 29 11.37	14.721	+0.003
ξ^2 Libræ	5.6	K0	14 52 22.182	+3.2510	–.0006	–11 5 0.81	–14.639	–0.001
Piazzi 221	5.8	A0	14 52 23.753	2.8299	–.0021	+14 46 22.53	14.647	–0.011
β Lupi	2.8	B2p	14 53 13.008	3.9147	–.0070	–42 48 31.36	14.649	–0.062
δ Libræ †	*var.*	A0	14 56 38.497	3.2017	–.0051	– 8 11 53.93	14.396	–0.015
β Boötis	3.6	G5	14 58 53.702	2.2600	–.0036	+40 42 33.88	14.282	–0.040
γ Scorpii	3.4	Ma	14 59 19.523	+3.5057	–.0056	–24 57 51.73	–14.263	–0.048
ψ Boötis	4.7	K0	15 0 58.475	2.5704	–.0133	+27 15 45.97	14.127	–0.014
c Boötis	5.0	F0	15 3 44.596	2.6348	+.0136	+25 11 1.84	14.125	–0.184
ζ Lupi	3.5	K0	15 6 27.405	4.2939	–.0126	–51 47 30.31	13.835	–0.066
ι Libræ	4.7	A0p	15 7 36.022	3.4148	–.0031	–19 29 10.09	13.750	–0.053
3 Serpentis	5.4	K0	15 11 9.668	+2.9802	–.0017	+ 5 14 21.45	–13.472	–0.005
γ Trianguli Australis	3.1	A0	15 11 19.475	5.5583	–.0137	–68 22 54.18	13.498	–0.042
δ Boötis	3.5	K0	15 12 14.245	2.4193	+.0075	+33 36 58.54	13.523	–0.125
β Libræ	2.7	B8	15 12 38.743	+3.2253	–.0066	– 9 5 5.52	13.395	–0.024
γ Ursæ Minoris	3.1	A2	15 20 50.833	–0.1128	–.0020	+72 7 19.86	12.815	+0.013
μ Boötis *pr.* †	4.5	F0	15 21 25.828	+2.2664	–.0121	+37 39 38.09	–12.708	+0.081
τ^1 Serpentis	5.5	Ma	15 22 1.883	2.7802	–.0024	+15 42 43.20	12.772	–0.024
ι Draconis	3.5	K0	15 23 7.660	1.3339	+.0014	+59 14 57.64	12.665	+0.010
32 Libræ	5.9	K0	15 23 41.112	3.3793	+.0006	–16 26 6.06	12.680	–0.043
β Coronæ Borealis	3.7	Fp	15 24 29.370	2.4739	–.0130	+29 23 3.08	12.503	+0.078
ν^1 Boötis	5.2	K5	15 28 1.192	+2.1553	+.0016	+41 6 30.63	–12.354	–0.014
γ Lupi (*mean*) †	3.0	B3	15 29 44.205	3.9882	–.0020	–40 53 44.58	12.270	–0.049
γ Libræ	4.0	K0	15 30 59.562	3.3529	+.0047	–14 31 12.57	12.127	+0.006
α Coronæ Borealis	2.3	A0	15 31 15.471	2.5395	+.0090	+26 59 11.37	12.215	–0.100
ζ Coronæ Borealis *seq.* †	5.1	B8	15 36 19.671	2.2597	–.0005	+36 53 53.18	11.771	–0.012
α Serpentis	2.8	K0	15 40 16.608	+2.9533	+.0089	+ 6 40 46.62	–11.435	+0.042
β Serpentis	3.7	A2	15 42 26.951	2.7687	+.0054	+15 40 27.91	11.377	–0.055
κ Serpentis	4.3	K5	15 45 5.563	2.6997	–.0035	+18 23 26.88	11.229	–0.099
μ Serpentis	3.6	A0	15 45 23.463	3.1287	–.0058	– 3 10 59.66	11.136	–0.028
12 H. Draconis	5.1	A2	15 45 25.684	0.9081	+.0047	+62 50 58.31	11.174	–0.068
ε Serpentis	3.8	A0	15 46 46.602	+2.9886	+.0081	+ 4 43 14.98	–10.937	+0.070
ζ Ursæ Minoris	4.3	A2	15 46 55.296	–2.1957	+.0082	+78 2 39.38	11.000	–0.004
β Trianguli Australis	3.0	F0	15 47 59.525	+5.2607	–.0290	–63 10 55.58	11.326	–0.408
λ Libræ	5.1	B3	15 48 37.706	3.4780	–.0017	–19 55 33.86	10.918	–0.046
γ Serpentis	3.9	F8	15 52 42.646	2.7699	+.0212	+15 55 30.52	11.858	–1.289
π Scorpii	3.0	B2p	15 53 56.891	+3.6245	–.0010	–25 52 55.16	–10.526	–0.048
ε Coronæ Borealis	4.2	K0	15 54 13.973	+2.4824	–.0065	+27 6 41.85	–10.523	–0.067

φ Virginis, comp. 9^{m}, $4''.5$ s. f.
ε Boötis, comp. $5^{m}.1$, $2''.8$ n. pr.

δ Libræ, var., $2^{d}.33$, $4^{m}.8$–$6^{m}.2$
μ Boötis, star $6^{m}.7$, $108''$ s.

γ Lupi, binary, $3^{m}.7$, $3^{m}.9$, $0''.4$
ζ Cor. Bor., comp. $6^{m}.0$, $6''.2$ n. pr.

α Centauri, dup., $0^{m}.3$, $1^{m}.7$; companion s. pr. The position given is that of the center of gravity of the system. Corrections given on page x remain to be applied to reduce to the position of α^2 Centauri.

FOR JANUARY 0^d.701, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
δ Scorpii	2.5	B1p	15 55 32.417	+3.5429	−.0011	−22 23 31.98	−10.393	−0.035
θ Draconis	4.1	F8	16 0 22.222	1.1222	−.0392	+58 46 52.48	9.656	+0.339
β Scorpii †	2.9	B1	16 0 43.408	3.4841	−.0011	−19 35 5.00	9.996	−0.028
κ Herculis †	5.3	G5	16 4 25.048	2.7053	−.0039	+17 15 42.02	9.709	−0.023
Groombridge 2320	5.4	A0	16 6 5.780	0.1544	−.0074	+68 1 23.98	9.506	+0.052
φ Herculis	4.3	A0	16 6 13.044	+1.8899	−.0017	+45 8 48.10	− 9.512	+0.036
δ¹ Apodis	4.8	Mb	16 8 11.449	8.8669	−.0050	−78 29 39.35	9.451	−0.056
δ Ophiuchi	3.0	Ma	16 10 5.940	3.1418	−.0031	− 3 29 12.00	9.392	−0.144
σ Coronæ Bor. *seq.* †	5.8	G0	16 11 38.680	+2.2460	−.0223	+34 3 47.99	9.200	−0.072
19 Ursæ Minoris	5.5	B8	16 13 6.928	−1.7433	+.0007	+76 4 55.08	9.006	+0.008
γ² Normæ	4.1	K0	16 13 46.140	+4.4735	−.0216	−49 57 29.34	− 9.026	−0.064
ε Ophiuchi	3.3	K0	16 14 2.014	3.1722	+.0054	− 4 29 45.65	8.904	+0.037
σ Scorpii †	3.1	B1	16 16 15.705	3.6422	−.0011	−25 23 58.44	8.805	−0.039
τ Herculis	3.9	B5	16 17 18.362	1.8033	+.0001	+46 30 20.14	8.655	+0.029
γ Herculis	3.8	F0	16 18 20.767	+2.6456	−.0034	+19 20 32.74	8.566	+0.037
η Ursæ Minoris	5.0	F0	16 19 51.167	−1.7859	−.0231	+75 56 33.09	− 8.231	+0.252
γ Apodis	3.9	K0	16 20 58.848	+9.1150	−.0408	−78 43 4.41	8.476	−0.083
ω Herculis	4.5	Ap	16 21 40.369	2.7620	−.0028	+14 13 7:98	8.398	−0.059
η Draconis †	2.9	G5	16 22 53.507	0.8086	−.0020	+61 41 50.09	8.184	+0.058
α Scorpii (*Antares*) †	1.2	Map	16 24 26.272	3.6747	−.0006	−26 15 12.06	8.147	−0.028
β Herculis	2.8	K0	16 26 44.186	+2.5776	−.0076	+21 39 54.58	− 7.959	−0.025
λ Ophiuchi †	3.8	A0	16 26 49.602	+3.0242	−.0022	+ 2 9 36.92	8.005	−0.079
A Draconis	5.0	B8p	16 28 8.068	−0.1280	−.0049	+68 56 36.27	7.786	+0.036
τ Scorpii	2.9	B0	16 30 50.202	+3.7302	−.0013	−28 2 56.93	7.638	−0.034
σ Herculis	4.2	A0	16 31 29.483	1.9336	−.0006	+42 36 11.75	7.524	+0.026
ζ Ophiuchi	2.7	B0	16 32 41.797	+3.3012	+.0007	−10 24 14.54	− 7.430	+0.022
24 Scorpii	5.0	K0	16 36 53.153	3.4670	−.0017	−17 35 11.04	7.115	−0.004
ζ Herculis †	3.0	G0	16 38 13.941	2.2615	−.0364	+31 44 55.66	6.611	+0.390
α Trianguli Australis	1.9	K2	16 40 4.408	6.3271	+.0028	−68 52 51.28	6.899	−0.049
η Herculis	3.6	K0	16 40 7.096	2.0559	+.0031	+39 4 31.88	6.939	−0.093
Groombridge 2377	4.9	F0	16 43 45.621	+1.1377	+.0046	+56 55 34.54	− 6.484	+0.062
ε Scorpii	2.4	K0	16 44 54.788	3.8804	−.0505	−34 8 51.15	6.715	−0.264
49 Herculis	6.4	A0	16 48 23.544	2.7304	+.0010	+15 6 32.73	6.175	−0.014
ε¹ Aræ	4.2	K2	16 53 7.292	4.7724	−.0011	−53 2 15.54	5.783	−0.017
κ Ophiuchi	3.4	K0	16 53 49.991	2.8384	−.0199	+ 9 29 59.96	5.718	−0.011
30 Ophiuchi	5.0	K0	16 56 47.325	+3.1632	−.0018	− 4 6 7.65	− 5.534	−0.076
ε Herculis	3.9	A0	16 57 11.394	2.2947	−.0036	+31 2 41.50	5.402	+0.023
d Herculis	5.3	A2	16 58 36.841	2.2122	−.0016	+33 41 4.85	5.314	−0.009
η Ophiuchi †	2.6	A0	17 5 43.825	3.4377	+.0017	−15 37 32.47	4.611	+0.091
η Scorpii	3.4	F2	17 6 20.905	4.2929	+.0023	−43 8 2.07	4.956	−0.306
ζ Draconis	3.2	B5	17 8 32.982	+0.1697	−.0021	+65 48 51.38	− 4.445	+0.018
α Herculis †	*var.*	Mb	17 10 57.199	2.7346	−.0008	+14 28 54.00	4.228	+0.029
δ Herculis †	3.2	A0	17 11 42.222	2.4633	−.0019	+24 56 1.90	4.351	−0.158
π Herculis	3.4	K2	17 12 13.493	2.0886	−.0025	+36 53 58.84	4.149	−0.001
θ Ophiuchi	3.4	B3	17 17 1.984	3.6821	−.0006	−24 55 11.69	3.772	−0.036
w Herculis	5.4	G0	17 17 37.652	+2.2431	+.0096	+32 34 15.81	− 4.732	−1.047
β Aræ	2.8	K2	17 18 33.787	4.9818	−.0004	−55 27 17.07	3.632	−0.027
b Ophiuchi	4.3	F0	17 21 25.270	3.6611	−.0009	−24 6 7.68	3.496	−0.137
σ Ophiuchi	4.4	K0	17 22 29.704	2.9758	+.0002	+ 4 12 35.37	3.258	+0.008
δ Aræ	3.8	B8	17 23 46.851	5.4068	−.0098	−60 37 5.61	3.275	−0.120
α Aræ	3.0	B3p	17 25 34.640	+4.6334	−.0036	−49 48 48.39	− 3.083	−0.083
λ Herculis	4.5	K0	17 27 27.870	2.4242	+.0016	+26 10 15.12	2.818	+0.018
λ Scorpii	1.7	B2	17 28 6.375	4.0713	−.0004	−37 2 45.23	2.809	−0.027
β Draconis	3.0	G0	17 28 36.101	1.3544	−.0017	+52 21 39.00	2.729	+0.009
α Ophiuchi	2.1	A5	17 31 10.425	2.7839	+.0080	+12 37 4.63	2.749	−0.235
ξ Serpentis	3.6	A5	17 32 56.808	+3.4331	−.0038	−15 20 54.85	− 2.421	−0.060
ι Herculis	3.8	B3	17 37 10.714	+1.6937	+.0003	+46 2 55.83	− 1.990	+0.003

β Scorpii, comp. 5^m.1, 13″.3 n. f.
κ Herculis, star 6^m.5, 29″.7 n. f.
σ Cor. Bor., comp. 6^m.7, 4″.6 s. pr.
σ Scorpii, star 8^m, 21″ pr.
η Draconis, comp. 8^m, 5″.4 s. f.

α Scorpii, comp. 7^m, 3″.2 pr.
λ Ophiuchi, comp. 6^m, 1″.2 n. f.
ζ Herculis, binary, 3^m.0, 6^m.0, 1″
η Oph., binary, 3^m.2, 3^m.7, 0″.5

α Herculis, var. irreg., 3^m.1–3^m.9, dup., comp. 6^m, 4″.6 s. f.
δ Herculis, binary, comp. 8^m, 11″ s. pr.

MEAN PLACES OF TEN-DAY STARS, 1919.

FOR JANUARY 0^d.701, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
ω Draconis	4.9	F5	17 37 25.432	−0.3538	+.0014	+68 47 43.71	−1.653	+0.318
η Pavonis	3.6	K0	17 37 46.683	+5.8821	−.0028	−64 41 13.12	2.020	−0.080
β Ophiuchi	2.9	K0	17 39 28.239	2.9630	−.0026	+ 4 36 0.53	1.636	+0.158
ι^1 Scorpii	3.1	F5p	17 41 55.142	4.1949	+.0006	−40 5 48.91	1.588	−0.008
μ Herculis	3.5	G5	17 43 17.267	+2.3472	−.0238	+27 46 2.00	2.210	−0.749
ψ Draconis †	4.9	F5	17 43 22.511	−1.0734	+.0024	+72 11 20.25	−1.721	−0.268
γ Ophiuchi	3.7	A0	17 43 49.827	+3.0073	−.0016	+ 2 44 12.40	1.486	−0.073
ξ Draconis	3.9	K0	17 52 7.760	1.0382	+.0130	+56 53 6.02	0.611	+0.077
89 Herculis	5.5	F2	17 52 9.152	+2.4208	+.0013	+26 3 43.38	0.680	+0.006
35 Draconis	5.0	F5	17 53 4.420	−2.6898	+.0115	+76 58 27.99	0.363	+0.243
θ Herculis	4.0	K0	17 53 28.491	+2.0571	+.0006	+37 15 37.78	−0.566	+0.004
ν Ophiuchi	3.5	K0	17 54 33.998	3.3020	−.0006	− 9 45 53.13	0.595	−0.120
ξ Herculis	3.8	K0	17 54 37.040	2.3315	+.0072	+29 15 20.91	0.488	−0.018
γ Draconis	2.4	K5	17 54 43.502	1.3926	−.0006	+51 29 52.38	0.485	−0.024
67 Ophiuchi	3.9	B5p	17 56 35.312	3.0050	+.0008	+ 2 56 4.02	0.311	−0.013
θ Aræ	3.9	B1	18 0 19.506	+4.6699	−.0010	−50 5 54.85	−0.022	−0.050
γ Sagittarii	3.1	K0	18 0 36.186	3.8520	−.0055	−30 25 34.86	0.145	−0.198
70 Ophiuchi †	4.1	K0	18 1 21.623	3.0317	+.0178	+ 2 31 1.86	−1.003	−1.122
72 Ophiuchi	3.7	A2	18 3 30.534	2.8433	−.0045	+ 9 33 5.20	+0.394	+0.087
ο Herculis	3.8	A0	18 4 22.938	2.3395	−.0002	+28 45 1.71	0.385	+0.002
μ Sagittarii	4.0	B8p	18 8 55.117	+3.5870	−.0004	−21 4 52.30	+0.778	−0.002
η Sagittarii	3.2	Mb	18 12 8.815	4.0597	−.0109	−36 47 13.33	0.909	−0.153
Groombridge 2533	5.4	B5	18 13 7.580	1.8653	−.0006	+42 7 51.81	1.146	−0.001
36 Draconis	5.0	F5	18 13 25.842	0.3456	+.0535	+64 22 10.70	1.200	+0.026
δ Sagittarii	2.8	K0	18 15 48.504	3.8405	+.0023	−29 51 49.65	1.348	−0.034
η Serpentis	3.4	K0	18 17 7.053	+3.1028	−.0378	− 2 55 14.85	+0.804	−0.692
ε Sagittarii	2.0	A0	18 18 47.718	3.9814	−.0041	−34 25 26.53	1.520	−0.122
109 Herculis	3.9	K0	18 20 14.753	2.5560	+.0139	+21 43 54.57	1.507	−0.261
α Telescopii	3.8	B3	18 20 58.065	+4.4498	−.0017	−46 0 52.17	1.763	−0.068
χ Draconis	3.7	F8	18 22 31.194	−1.0789	+.1177	+72 41 52.60	1.595	−0.372
λ Sagittarii	2.9	K0	18 22 58.317	+3.7027	−.0033	−25 28 4.03	+1.807	−0.199
c Serpentis	5.4	G5	18 25 28.038	3.1215	+.0015	− 2 2 19.41	2.188	−0.035
1 Aquilæ	4.1	K0	18 30 47.949	3.2646	−.0013	− 8 18 6.32	2.370	−0.315
ζ Pavonis	4.1	K0	18 33 34.472	7.0181	−.0057	−71 29 58.69	2.762	−0.165
α Lyræ (*Vega*)	0.1	A0	18 34 11.758	2.0314	+.0177	+38 42 27.12	3.260	+0.280
2 Aquilæ	4.7	F0	18 37 50.390	+3.2865	+.0020	− 9 7 52.09	+3.289	−0.006
φ Sagittarii	3.3	B8	18 40 35.761	3.7485	+.0034	−27 4 30.76	3.526	−0.006
110 Herculis	4.3	F5	18 42 10.482	2.5804	−.0019	+20 28 4.16	3.324	−0.344
6 Aquilæ	4.5	G0	18 42 52.597	3.1828	−.0009	− 4 50 8.17	3.705	−0.023
λ Pavonis	4.4	B2	18 44 42.917	5.5649	−.0030	−62 16 55.33	3.864	−0.022
β Lyræ †	*var.*	B2p	18 47 5.348	+2.2148	+.0004	+33 16 4.27	+4.085	−0.005
50 Draconis	5.4	A0	18 48 59.741	−1.9221	−.0031	+75 20 19.72	4.304	+0.051
ο Draconis †	4.8	K0	18 50 0.506	+0.8879	+.0116	+59 17 20.47	4.363	+0.023
σ Sagittarii	2.1	B3	18 50 14.554	3.7198	−.0003	−26 23 55.10	4.285	−0.075
θ Serpentis *pr.* †	4.5	A5	18 52 11.546	2.9821	+.0027	+ 4 5 49.86	4.553	+0.028
R Lyræ †	*var.*	Mb	18 52 52.240	+1.8260	+.0026	+43 50 19.51	+4.662	+0.078
γ Lyræ	3.3	A0	18 55 54.785	2.2435	−.0006	+32 34 39.40	4.837	−0.006
ε Aquilæ	4.2	K0	18 55 56.746	2.7221	−.0042	+14 57 26.25	4.763	−0.081
ζ Sagittarii †	2.7	A2	18 57 27.519	3.8176	−.0024	−29 59 50.36	4.954	−0.019
ζ Aquilæ	3.0	A0	19 1 41.211	2.7569	−.0008	+13 44 31.58	5.231	−0.099
λ Aquilæ	3.6	A0	19 1 57.018	+3.1835	−.0020	− 5 0 17.67	+5.270	−0.083
α Coronæ Australis	4.1	A2	19 3 57.723	4.0827	+.0051	−38 1 55.54	5.404	−0.118
ι Lyræ	5.1	B5	19 4 24.702	2.1413	+.0005	+35 58 20.67	5.553	−0.006
π Sagittarii	3.0	F2	19 4 56.850	3.5686	−.0005	−21 9 12.49	5.569	−0.036
ψ Sagittarii	4.9	F5	19 10 34.489	3.6798	+.0025	−25 23 50.89	6.040	−0.035
δ Draconis	3.2	K0	19 12 32.458	+0.0214	+.0175	+67 31 8.50	+6.327	+0.088
d Sagittarii	5.0	K0	19 12 53.780	+3.5107	−.0015	−19 5 53.38	+6.252	−0.017

ψ Draconis, star 6^m.1, 30″.4 n. f.
70 Ophiuchi, comp. 6^m, 5″.3 s. f.

β Lyræ, var., 12^d.9, 3^m.4–4^m.1, star 7^m, 46″ s. f.
ο Draco., star 7^m.6, 32″.1 n. pr.

θ Serpentis, star 5^m.4, 22″.2 s. f.
R Lyræ, var., 46^d.4, 4^m.0–4^m.7
ζ Sag., binary, 3^m.4, 3^m.6, 0″.5

FOR JANUARY 0^{d}.701, WASHINGTON MEAN TIME.

Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
θ Lyræ	4.5	K0	19 13 33.349	+2.0808	−.0015	+37 59 19.84	+ 6.330	+0.006
ω Aquilæ	5.1	A5	19 14 0.868	2.8158	−.0002	+11 26 54.23	6.376	+0.014
κ Cygni	4.0	K0	19 15 13.906	+1.3877	+.0071	+53 13 6.67	6.584	+0.121
τ Draconis	4.6	K0	19 17 7.262	−1.1380	−.0312	+73 12 19.82	6.728	+0.109
δ Aquilæ	3.4	F0	19 21 24.869	+3.0249	+.0168	+ 2 57 8.31	7.053	+0.081
β Cygni †	3.2	K0p	19 27 27.264	+2.4189	−.0002	+27 47 19.31	+ 7.455	−0.010
ι Cygni	3.9	A2	19 27 39.862	1.5132	+.0023	+51 33 24.13	7.610	+0.129
μ Aquilæ	4.6	K0	19 30 7.976	2.9311	+.0145	+ 7 12 22.16	7.536	−0.146
h Sagittarii	4.7	B9	19 31 46.764	3.6526	+.0045	−25 3 48.62	7.788	−0.027
κ Aquilæ	5.0	B0	19 32 32.095	3.2286	+.0005	− 7 12 30.39	7.877	+0.002
θ Cygni	4.6	F5	19 34 16.181	+1.6088	−.0024	+50 1 58.58	+ 8.265	+0.250
54 Sagittarii	5.4	K0	19 36 5.044	3.4384	+.0046	−16 28 48.10	8.113	−0.047
β Sagittæ	4.4	K0	19 37 24.631	2.6939	+.0001	+17 17 15.13	8.234	−0.032
15 Cygni	5.0	K0	19 41 21.362	2.1641	+.0068	+37 9 29.24	8.619	+0.040
f Sagittarii	5.1	K0	19 41 38.298	3.5011	−.0099	−19 57 24.54	8.513	−0.088
γ Aquilæ	2.8	K2	19 42 24.521	+2.8519	+.0007	+10 24 53.79	+ 8.659	−0.003
δ Cygni †	3.0	A0	19 42 26.649	1.8760	+.0055	+44 55 56.65	8.709	+0.044
δ Sagittæ	3.8	Map	19 43 46.564	2.6748	+.0004	+18 20 1.18	8.787	+0.017
α Aquilæ (*Altair*)	0.9	A5	19 46 49.878	2.9270	+.0360	+ 8 39 12.36	9.388	+0.379
η Aquilæ †	*var.*	G0	19 48 20.833	+3.0566	+.0005	+ 0 47 48.58	9.119	−0.008
ε Draconis †	4.0	K0	19 48 27.372	−0.1894	+.0170	+70 3 41.73	+ 9.163	+0.027
ι Sagittarii	4.2	K0	19 49 40.496	+4.1422	−.0017	−42 4 56.15	9.275	+0.045
ε Pavonis	4.1	A0	19 51 14.672	6.9806	+.0112	−73 7 33.22	9.232	−0.120
β Aquilæ	3.9	K0	19 51 20.069	2.9467	+.0025	+ 6 12 12.83	8.879	−0.481
γ Sagittæ	3.7	K5	19 55 9.266	2.6673	+.0041	+19 16 16.80	9.678	+0.025
c Sagittarii	4.6	Mb	19 57 40.791	+3.6923	+.0023	−27 56 9.93	+ 9.860	+0.013
τ Aquilæ	5.6	K0	20 0 10.997	2.9307	+.0010	+ 7 2 55.49	10.066	+0.029
θ Aquilæ	3.4	A0	20 7 7.563	3.0958	+.0020	− 1 3 45.36	10.563	+0.006
o Cygni *seq.* †	4.0	K0p	20 11 4.912	+1.8901	+.0014	+46 29 42.42	10.855	+0.005
κ Cephei †	4.4	B9	20 11 38.590	−1.9721	+.0024	+77 28 5.02	10.917	+0.026
24 Vulpeculæ	5.4	K0	20 13 19.143	+2.5674	+.0017	+24 25 15.00	+11.002	−0.012
α^2 Capricorni †	3.8	K0	20 13 33.706	3.3301	+.0040	−12 47 48.47	11.040	+0.008
β Capricorni †	3.2	G0p	20 16 27.746	3.3730	+.0030	−15 2 17.00	11.249	+0.007
α Pavonis	2.1	B3	20 19 14.863	4.7619	.0000	−56 59 45.18	11.351	−0.092
γ Cygni	2.3	F8p	20 19 19.253	2.1527	+.0004	+39 59 48.36	11.449	+0.001
π Capricorni †	5.2	B8	20 22 41.186	+3.4358	+.0004	−18 28 40.92	+11.687	−0.002
ρ Capricorni †	5.0	F0	20 24 14.539	3.4241	−.0013	−18 4 56.46	11.779	−0.020
41 Cygni	4.1	F5	20 26 5.201	2.4516	+.0014	+30 5 51.33	11.928	−0.002
θ Cephei	4.3	A5	20 28 13.538	1.0111	+.0066	+62 43 17.36	12.062	−0.018
ε Delphini	4.0	B5	20 29 20.610	+2.8663	+.0007	+11 1 37.66	12.132	−0.025
Groombridge 3241	6.4	K2	20 30 22.041	−0.2414	−.0047	+72 15 26.42	+12.210	−0.018
α Indi	3.2	K0	20 31 52.417	+4.2281	+.0027	−47 34 30.48	12.386	+0.053
β Delphini †	3.7	F5	20 33 45.081	2.8138	+.0082	+14 18 45.29	12.426	−0.035
υ Capricorni	5.3	Ma	20 35 26.440	3.4176	−.0018	−18 25 28.32	12.570	−0.007
α Delphini	3.9	B8	20 35 52.561	2.7868	+.0047	+15 37 32.85	12.623	+0.017
β Pavonis	3.6	A5	20 37 40.560	+5.4385	−.0079	−66 29 44.46	+12.725	−0.003
α Cygni (*Deneb*)	1.3	A2p	20 38 40.208	2.0448	+.0004	+44 59 24.97	12.793	−0.002
δ Delphini	4.5	A2	20 39 40.646	2.8008	−.0014	+14 46 59.21	12.813	−0.050
ψ Capricorni	4.3	F8	20 41 18.163	3.5560	−.0041	−25 33 45.55	12.824	−0.148
γ Delphini *seq.* †	4.5	G5	20 42 54.014	2.7832	−.0023	+15 49 53.95	12.882	−0.196
ε Cygni	2.6	K0	20 42 56.024	+2.4276	+.0294	+33 39 58.29	+13.407	+0.327
ε Aquarii	3.8	A0	20 43 17.552	3.2490	+.0017	− 9 47 35.03	13.074	−0.030
η Cephei	3.6	K0	20 43 38.675	1.2240	+.0132	+61 31 25.92	13.947	+0.820
μ Aquarii	4.8	A3	20 48 17.181	3.2374	+.0025	− 9 17 17.40	13.393	−0.039
β Indi	3.7	K0	20 48 29.396	4.7086	+.0018	−58 45 38.12	13.436	−0.008
32 Vulpeculæ	5.2	K2	20 51 6.450	+2.5564	−.0003	+27 44 56.14	+13.618	+0.004

β Cygni, star 5^{m}.4, 34″.7 n. f.
δ Cygni, comp. 8^{m}, 1″.6 n. pr.
η Aquilæ, var., 7^{d}.18, 3^{m}.7–4^{m}.4
ε Draconis, comp. 7^{m}.6, 3″.1 n.

o Cygni, star 5^{m}.0 pr. 19^{s}, 270″ n., star 7^{m}.8 f. 1^{s}, 96″ s.
κ Cephei, comp. 8^{m}, 7″.5 s. f.
α^2 Capricor., α^1 Capricor. 4^{m}.6 pr. 24^{s}, 137″ n.

β Capricor., star 6^{m}.2 pr. 14^{s}, 10″ s.
π Capricor., comp. 9^{m}, 3″.4 s. f.
ρ Capricor., comp. 7^{m}.6, 2″.8 s.
β Delphini, binary, 4^{m}.1, 5^{m}.4, 0″.5
γ Delphini, comp. 5^{m}.5, 11″.2 pr.

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
220 H^1. Draconis	5.6	K0	20 51 18.445	−2.6412	−.0105	+80 14 57.55	+13.601	−0.025
ν Cygni	4.0	A0	20 54 9.161	+2.2357	+.0008	+40 51 16.75	13.790	−0.018
α Octantis	5.2	F2	20 54 57.160	7.3685	−.0006	−77 20 4.53	13.469	−0.389
γ Microscopii	4.7	G5	20 56 19.631	3.6856	−.0004	−32 34 30.68	13.941	−0.004
θ Capricorni	4.2	A0	21 1 23.751	3.3749	+.0051	−17 33 20.16	14.194	−0.066
ξ Cygni	3.9	K5	21 1 59.037	+2.1814	+.0009	+43 36 15.27	+14.305	+0.008
61 Cygni *pr.*	5.6	K5	21 3 15.836	2.6854	+.3496	+38 21 1.37	17.624	+3.249
61 Cygni *seq.*	6.3	K5	Δα + 1.494	....	...	Δδ −15.96	....	...
ν Aquarii	4.5	K0	21 5 10.986	+3.2696	+.0057	−11 42 1.06	14.485	−0.006
Bradley 2777	5.9	A	21 7 8.907	−1.1486	+.0102	+77 47 53.39	14.639	+0.029
3 Piscis Australis	5.6	K5	21 8 29.333	+3.5627	+.0075	−27 57 1.69	+14.583	−0.106
ζ Cygni	3.4	K0	21 9 29.280	2.5522	−.0002	+29 53 38.40	14.687	−0.061
τ Cygni †	3.8	F0	21 11 33.424	2.3942	+.0141	+37 41 56.72	15.304	+0.434
α Equulei	4.1	F8p	21 11 46.504	2.9991	+.0034	+ 4 54 44.19	14.798	−0.085
σ Cygni	4.3	A0p	21 14 14.011	2.3550	−.0001	+39 3 17.18	15.029	+0.003
θ^1 Microscopii	4.9	A2p	21 15 34.975	+3.8433	+.0028	−41 9 9.83	+15.109	+0.005
α Cephei	2.6	A5	21 16 38.892	1.4347	+.0224	+62 14 31.36	15.215	+0.050
ι Capricorni	4.3	K0	21 17 44.339	3.3436	+.0022	−17 10 48.86	15.231	+0.004
1 Pegasi	4.2	K0	21 18 20.412	2.7741	+.0075	+19 27 26.34	15.326	+0.064
γ Pavonis	4.3	F8	21 19 45.864	4.9959	+.0154	−65 44 2.02	16.126	+0.784
ζ Capricorni	3.9	G5p	21 22 2.752	+3.4297	+.0004	−22 45 46.43	+15.490	+0.020
g Cygni †	5.3	K0	21 26 27.567	2.2129	+.0050	+46 10 58.76	15.818	+0.105
β Aquarii	3.1	G0	21 27 17.762	3.1596	+.0012	− 5 55 41.62	15.747	−0.011
β Cephei †	3.3	B1	21 27 37.302	0.7846	+.0026	+70 12 17.78	15.781	+0.005
ξ Aquarii	4.8	A5	21 33 26.480	3.1954	+.0075	− 8 13 5.17	16.061	−0.023
74 Cygni	5.1	A5	21 33 42.098	+2.4036	+.0003	+40 2 56.72	+16.107	+0.009
γ Capricorni	3.8	F0p	21 35 36.330	3.3267	+.0129	−17 1 43.54	16.179	−0.017
ε Pegasi	2.5	K0	21 40 12.445	2.9461	+.0016	+ 9 30 10.84	16.430	0.000
11 Cephei	4.8	K0	21 40 44.390	0.8868	+.0221	+70 56 17.60	16.550	+0.093
δ Capricorni	3.0	A5	21 42 34.325	3.3136	+.0176	−16 29 43.77	16.251	−0.297
π^2 Cygni	4.3	B3	21 43 47.969	+2.2149	+.0009	+48 56 3.65	+16.607	−0.001
μ Capricorni	5.2	F0	21 48 52.886	3.2726	+.0204	−13 56 1.72	16.854	+0.001
γ Gruis	3.2	B8	21 49 1.695	3.6400	+.0077	−37 44 47.51	16.839	−0.021
16 Pegasi	5.0	B3	21 49 22.539	2.7286	+.0005	+25 32 36.97	16.882	+0.006
79 Draconis	6.6	A0	21 51 50.682	0.7169	+.0100	+73 19 8.01	17.008	+0.016
20 Pegasi	5.7	F2	21 57 8.560	+2.9222	+.0038	+12 43 52.90	+17.180	−0.054
ε Indi	4.7	K5	21 57 10.319	4.6066	+.4783	−57 7 10.29	14.663	−2.571
α Aquarii	3.2	G0	22 1 37.459	3.0819	+.0010	− 0 42 49.76	17.428	−0.002
ι Aquarii	4.4	B8	22 2 3.847	3.2421	+.0022	−14 15 47.63	17.388	−0.062
20 Cephei	5.4	K5	22 2 32.767	1.8230	+.0032	+62 23 24.23	17.521	+0.051
α Gruis	2.2	B5	22 3 8.061	+3.7919	+.0110	−47 21 14.79	+17.321	−0.174
ι Pegasi	4.0	F5	22 3 14.360	2.7917	+.0222	+24 56 56.23	17.520	+0.021
θ Pegasi	3.7	A0	22 6 6.859	3.0267	+.0187	+ 5 47 56.15	17.657	+0.036
π Pegasi	4.4	F5	22 6 23.322	2.6630	−.0003	+32 46 49.08	17.614	−0.018
ζ Cephei	3.6	K0	22 8 2.522	2.0785	+.0018	+57 48 6.07	17.711	+0.010
24 Cephei	5.0	G5	22 8 15.199	+1.1568	+.0044	+71 56 31.04	+17.713	+0.004
θ Aquarii	4.3	K0	22 12 33.629	3.1669	+.0074	− 8 11 13.41	17.864	−0.019
α Tucanæ	2.9	K2	22 12 57.760	4.1315	−.0118	−60 39 49.32	17.864	−0.035
γ Aquarii	4.0	A0	22 17 28.383	3.0989	+.0081	− 1 47 45.05	18.088	+0.015
31 Pegasi	4.9	B3p	22 17 31.866	2.9530	+.0010	+11 47 47.67	18.082	+0.007
3 Lacertæ	4.6	K0	22 20 22.348	+2.3562	−.0007	+51 49 22.35	+17.992	−0.188
π Aquarii	4.6	B1	22 21 8.418	3.0637	+.0004	+ 0 57 57.11	18.208	−0.001
σ Aquarii	4.9	A0	22 26 21.744	3.1768	.0000	−11 5 34.13	18.370	−0.026
α Lacertæ	3.8	A0	22 27 57.137	2.4687	+.0157	+49 51 56.36	18.464	+0.014
υ Aquarii	5.3	F5	22 30 15.869	3.2845	+.0148	−21 7 25.34	18.374	−0.154
226 B. Cephei	5.7	A0	22 30 51.359	+1.0634	−.0052	+75 48 32.11	+18.548	0.000

τ Cygni, comp. 7^m, 0″.8 | **g Cygni, star $6^m.7$ f. 10^s, 420″ s.** | **β Cephei, star 8^m, 13″.3 s. pr.**

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
η Aquarii	4.1	B8	22 31 11.670	+3.0831	+.0057	− 0 32 7.29	+18.506	−0.053
10 Lacertæ	4.9	Oe5	22 35 37.482	2.6895	+.0011	+38 37 41.82	18.691	−0.011
ε Piscis Australis	4.2	B8	22 36 10.690	3.3219	+.0008	−27 28 0.09	18.708	−0.011
ζ Pegasi	3.6	B8	22 37 25.309	2.9915	+.0054	+10 24 29.16	18.744	−0.014
β Gruis	2.2	Mb	22 37 50.229	3.5943	+.0133	−47 18 31.48	18.744	−0.026
η Pegasi	3.1	G0	22 39 12.185	+2.8096	+.0011	+29 47 49.60	+18.775	−0.037
λ Pegasi	4.1	K0	22 42 37.657	2.8873	+.0037	+23 8 20.58	18.905	−0.009
ε Gruis	3.7	A2	22 43 40.108	3.6361	+.0093	−51 44 35.00	18.885	−0.059
τ Aquarii	4.2	K5	22 45 18.314	3.1787	−.0008	−14 1 13.51	18.957	−0.033
μ Pegasi	3.7	K0	22 46 5.536	2.8936	+.0110	+24 10 24.76	18.970	−0.042
ι Cephei	3.7	K0	22 46 47.566	+2.1290	−.0111	+65 46 26.79	+18.905	−0.126
λ Aquarii	3.8	Ma	22 48 23.374	3.1307	+.0002	− 8 0 39.48	19.110	+0.035
ρ Indi	6.1	G5	22 49 2.372	4.2097	−.0133	−70 30 24.74	19.146	+0.053
δ Aquarii	3.5	A2	22 50 21.179	3.1858	−.0034	−16 15 6.91	19.101	−0.026
α Pisc. Aust. (*Fomalhaut*)	1.3	A3	22 53 10.690	3.3201	+.0252	−30 3 6.93	19.028	−0.171
ο Andromedæ	3.6	B5p	22 58 11.426	+2.7553	+.0020	+41 53 25.32	+19.311	−0.010
β Pegasi †	*var.*	Ma	22 59 50.719	2.9057	+.0146	+27 38 35.22	19.494	+0.135
α Pegasi (*Markab*)	2.6	A0	23 0 43.476	2.9866	+.0040	+14 46 9.09	19.339	−0.039
55 Pegasi	4.7	Ma	23 2 55.384	3.0210	+.0003	+ 8 58 17.79	19.415	−0.012
c^2 Aquarii	3.8	K0	23 5 7.779	3.2015	+.0032	−21 36 44.62	19.515	+0.041
π Cephei †	4.6	G5	23 5 19.035	+1.9004	+.0023	+74 56 57.96	+19.445	−0.032
ι Gruis	4.1	K0	23 5 46.734	3.4056	+.0121	−45 41 8.78	19.456	−0.031
59 Pegasi	5.2	A3	23 7 38.776	3.0279	−.0007	+ 8 16 48.23	19.529	+0.004
5 H^1. Cassiopeiæ	5.6	K2	23 9 22.656	2.8802	+.2536	+56 43 15.70	19.857	+0.299
φ Aquarii	4.4	Ma	23 10 7.664	3.1070	+.0015	− 6 29 9.31	19.378	−0.194
ψ Aquarii †	4.5	K0	23 11 38.956	+3.1446	+.0250	− 9 31 44.80	+19.596	−0.005
γ Tucanæ	4.1	F2	23 12 42.587	3.5170	−.0057	−58 40 49.40	19.680	+0.060
γ Piscium	3.8	K0	23 12 57.950	3.1093	+.0502	+ 2 50 22.23	19.645	+0.021
γ Sculptoris	4.5	K0	23 14 27.173	3.2440	+.0002	−32 58 24.71	19.585	−0.066
ο Cephei †	4.9	G5	23 15 17.576	2.4534	+.0113	+67 40 5.43	19.683	+0.018
τ Pegasi	4.6	A5	23 16 37.518	+2.9662	+.0018	+23 17 48.21	+19.676	−0.012
b^1 Aquarii	4.2	K0	23 18 43.066	3.1526	−.0099	−20 32 34.81	19.631	−0.089
4 Cassiopeiæ	5.2	K5	23 21 13.896	2.6520	−.0004	+61 50 16.69	19.749	−0.010
υ Pegasi	4.6	G0	23 21 20.049	2.9910	+.0134	+22 57 28.51	19.791	+0.030
κ Piscium	4.9	A2p	23 22 46.809	3.0752	+.0056	+ 0 48 43.44	19.689	−0.093
θ Piscium	4.4	G5	23 23 51.502	+3.0421	−.0088	+ 5 56 2.26	+19.756	−0.041
70 Pegasi	4.7	K0	23 25 3.403	3.0324	+.0040	+12 18 48.80	19.848	+0.035
β Sculptoris	4.5	B9	23 28 37.903	3.2236	+.0071	−38 15 59.68	19.863	+0.006
72 Pegasi (*mean*) †	5.2	K2	23 29 55.872	2.9716	+.0035	+30 52 41.59	19.863	−0.009
λ Andromedæ	4.0	K0	23 33 35.687	2.9293	+.0158	+46 1 9.20	19.492	−0.420
ι Andromedæ	4.3	B8	23 34 9.538	+2.9358	+.0025	+42 49 10.40	+19.918	0.000
ι Piscium	4.3	G0	23 35 46.994	3.0845	+.0246	+ 5 11 13.77	19.497	−0.436
γ Cephei	3.4	K0	23 36 0.740	2.4418	−.0173	+77 10 49.01	20.093	+0.157
κ Andromedæ	4.3	A0	23 36 24.830	2.9485	+.0078	+43 53 6.96	19.915	−0.024
$ω^2$ Aquarii	4.6	A0	23 38 31.368	3.1124	+.0063	−14 59 33.97	19.895	−0.063
$ĩ^1$ Aquarii	5.3	B8	23 40 0.125	+3.1141	+.0019	−18 43 35.99	+19.963	−0.006
ψ Andromedæ	5.1	K0	23 42 0.896	2.9649	+.0005	+45 58 13.55	19.976	−0.008
41 H. Cephei	5.0	A0	23 44 1.674	2.8520	+.0024	+67 21 23.86	19.987	−0.010
δ Sculptoris	4.6	A0	23 44 42.495	3.1271	+.0059	−28 34 43.15	19.868	−0.133
φ Pegasi	5.2	Ma	23 48 21.877	3.0485	−.0013	+18 40 13.36	19.980	−0.039
ρ Cassiopeiæ	4.8	F8p	23 50 19.677	+2.9835	−.0022	+57 2 55.54	+20.029	+0.002
Groombridge 4163	6.6	B9	23 50 52.230	2.8836	−.0040	+73 57 34.27	20.025	−0.005
ω Piscium	4.0	F5	23 55 9.057	3.0797	+.0102	+ 6 24 53.79	19.933	−0.108
ε Tucanæ	4.7	B9	23 55 43.016	3.1364	+.0076	−66 1 38.95	20.035	−0.007
30 Piscium	4.7	Mb	23 57 48.368	3.0771	+.0030	− 6 27 51.19	20.007	−0.037
2 Ceti	4.6	A0	23 59 35.489	+3.0749	+.0015	−17 47 13.16	+20.032	−0.013

β Pegasi, var. irreg., $2^{m}.2$–$2^{m}.7$
π Cephei, comp. 7^{m}, 0″.9 f.
ψ Aquarii, star $8^{m}.5$, 49″.4 n. pr.
ο Cephei, comp. 8^{m}, 2″.9 s. pr.
72 Pegasi, binary, $6^{m}.0$, $6^{m}.0$, 0″.4

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			h m s	s	s	° ′ ″	″	″
43 H. Cephei . . .	4.5	K0	0 57 24.633	+ 7.6822	+.0732	+85 49 24.14	+19.415	−0.004
α Ursæ Min. (*Polaris*) . †	2.1	F8	1 31 11.709	+29.5294	+.1486	+88 52 20.55	+18.481	+0.002
4 G. Octantis . .	5.6	K0	1 41 54.846	− 3.7349	+.0086	−85 10 45.22	+18.124	+0.028
Groombridge 750 .	6.7	F8	4 10 37.831	+17.6528	+.0129	+85 20 28.88	+ 9.249	+0.042
Groombridge 944 .	6.4	K0	5 35 50.330	+18.7787	+.0130	+85 9 34.51	+ 2.105	−0.004
31 G. Mensæ . . .	6.2	A0	5 45 51.396	−11.6781	−.0122	−84 49 44.27	+ 1.323	+0.067
ζ Mensæ . . .	5.6	A2	6 46 48.653	− 4.9478	−.0036	−80 43 46.14	− 3.984	+0.082
51 H. Cephei . . .	5.3	Ma	7 3 2.335	+29.1137	−.0579	+87 10 43.86	− 5.479	−0.035
25 H. Camelopardalis .	5.1	Mb	7 14 7.912	+12.8037	+.0132	+82 34 17.32	− 6.418	−0.047
7 G. Octantis . .	6.4	F5	7 15 39.691	−20.3258	−.0146	−86 54 19.75	− 6.493	+0.005
Groombridge 1119 .	7.0	A0	8 17 47.546	+59.2588	−.0397	+88 52 37.80	−11.321	+0.017
ζ Octantis . . .	5.4	A3	9 8 41.594	− 8.1888	−.1147	−85 20 26.78	−14.658	+0.043
1 H. Draconis . .	4.6	K0	9 25 39.275	+ 8.7704	−.0059	+81 41 10.13	−15.696	−0.027
ζ Chamæleontis . .	5.2	B3	9 36 19.026	− 1.6637	−.0121	−80 34 39.26	−16.214	+0.019
30 H. Camèlopardalis .	5.3	F5	10 21 19.949	+ 7.5502	−.0462	+82 58 17.67	−18.207	+0.009
η Octantis . . .	6.3	A0	10 59 54.546	− 0.3703	−.0575	−84 9 29.33	−19.365	−0.005
Bradley 1672 . .	6.3	F0	12 14 29.190	+ 0.3895	−.0713	+88 8 56.19	−19.947	+0.058
ι Octantis . . .	5.4	K0	12 46 19.119	+ 5.9921	+.0366	−84 41 1.57	−19.613	+0.024
32 H. Camelop. *seq.* . †	5.3	A2	12 48 31.308	+ 0.4468	−.0184	+83 51 11.30	−19.582	+0.016
κ Octantis . . .	5.6	A2	13 27 32.891	+ 9.1502	−.0765	−85 22 19.48	−18.624	−0.024
δ Octantis . . .	4.1	K2	14 13 46.350	+ 9.2894	−.0512	−83 17 54.52	−16.741	−0.014
Groombridge 2283 .	7.2	K0	15 3 2.510	−19.2662	−.0068	+87 32 42.66	−13.954	+0.031
ρ Octantis . . .	5.7	A2	15 24 23.351	+13.3929	+.0842	−84 11 55.43	−12.508	+0.080
ε Ursæ Minoris . .	4.4	G5	16 54 12.991	− 6.2449	+.0057	+82 10 21.42	− 5.675	−0.001
59 G. Apodis . . .	5.9	Mb	17 16 17.234	+11.1713	+.0086	−80 47 14.27	− 3.839	−0.039
δ Ursæ Minoris . .	4.4	A0	17 58 22.311	−19.4972	+.0173	+86 36 51.04	− 0.095	+0.048
χ Octantis . . .	5.2	K0	18 7 23.343	+35.7206	−.0957	−87 39 50.89	+ 0.519	−0.127
λ Ursæ Minoris . .	6.6	Mb	19 0 15.079	−72.4933	−.1109	+89 1 12.80	+ 5.215	+0.006
σ Octantis . . .	5.5	F0	19 30 50.769	+93.7699	+.1079	−89 13 13.35	+ 7.739	−0.001
76 Draconis . . .	5.7	A0	20 48 32.146	− 4.1793	+.0131	+82 13 56.82	+13.473	+0.025
λ Octantis . . . †	5.4	G0p	21 38 38.548	+ 9.4923	+.0389	−83 5 34.33	+16.339	−0.012
υ Octantis . . ,	5.7	K0	22 16 33.212	+12.2485	−.0400	−86 22 50.92	+18.112	+0.074
β Octantis . . .	4.3	F0	22 37 51.624	+ 6.2982	−.0302	−81 48 24.80	+18.773	+0.002
39 H. Cephei . . .	5.6	F0	23 27 43.571	− 0.2831	+.0641	+86 51 38.62	+19.867	+0.020
γ^1 Octantis . . .	5.1	G5	23 47 23.637	+ 3.6038	−.0247	−82 28 8.42	+20.003	−0.012

α Ursæ Min., star 9^{m}, 18″ s. pr. | 32 H. Camelop., star $5^{m}.8$, 21″.6 n. pr. | λ Octantis, binary, $5^{m}.5$, $8^{m}.0$, 3″.2 nf.

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	0 57	+85 49	Jan.	1 31	+88 52	Jan.	1 41	−85 10	Jan.	4 10	+85 20	Jan.	5 36	+85 9
	s	″		s	″		s	″		s	″		s	″
0.3	32.06	49.91	0.3	49.26	45.14	0.3	55.81	60.28	0.4	58.57	40.77	0.5	12.48	36.92
1.3	31.79	50.03	1.3	48.29	45.30	1.3	55.53	60.28	1.4	58.48	41.08	1.5	12.50	37.24
2.3	31.50	50.14	2.3	47.24	45.46	2.3	55.28	60.27	2.4	58.38	41.40	2.5	12.51	37.57
3.3	31.19	50.24	3.3	46.14	45.61	3.3	55.03	60.26	3.4	58.26	41.72	3.4	12.50	37.92
4.3	30.87	50.31	4.3	44.99	45.76	4.3	54.78	60.26	4.4	58.13	42.04	4.4	12.46	38.27
5.3	30.56	50.36	5.3	43.83	45.87	5.3	54.54	60.26	5.4	57.98	42.32	5.4	12.42	38.61
6.2	30.24	50.39	6.3	42.67	45.95	6.3	54.27	60.27	6.4	57.82	42.59	6.4	12.36	38.94
7.2	29.95	50.39	7.3	41.55	46.01	7.3	54.01	60.28	7.4	57.65	42.83	7.4	12.28	39.24
8.2	29.65	50.39	8.3	40.50	46.05	8.3	53.74	60.31	8.4	57.49	43.07	8.4	12.20	39.52
9.2	29.40	50.39	9.3	39.51	46.10	9.3	53.45	60.34	9.4	57.34	43.27	9.4	12.14	39.79
10.2	29.15	50.39	10.3	38.57	46.15	10.3	53.13	60.34	10.4	57.20	43.48	10.4	12.07	40.05
11.2	28.91	50.40	11.3	37.68	46.21	11.3	52.82	60.31	11.4	57.07	43.69	11.4	12.03	40.31
12.2	28.67	50.44	12.3	36.76	46.30	12.3	52.53	60.26	12.4	56.97	43.92	12.4	12.00	40.57
13.2	28.40	50.48	13.3	35.80	46.39	13.3	52.23	60.18	13.4	56.84	44.17	13.4	11.97	40.85
14.2	28.13	50.52	14.2	34.76	46.49	14.3	51.94	60.09	14.4	56.71	44.43	14.4	11.93	41.17
15.2	27.84	50.54	15.2	33.66	46.57	15.3	51.68	60.00	15.4	56.57	44.68	15.4	11.88	41.49
16.2	27.52	50.55	16.2	32.50	46.63	16.3	51.43	59.89	16.4	56.40	44.95	16.4	11.79	41.81
17.2	27.21	50.55	17.2	31.28	46.68	17.2	51.19	59.80	17.4	56.20	45.20	17.4	11.70	42.13
18.2	26.88	50.50	18.2	30.07	46.71	18.2	50.94	59.75	18.3	55.99	45.43	18.4	11.58	42.43
19.2	26.57	50.44	19.2	28.89	46.71	19.2	50.69	59.68	19.3	55.78	45.64	19.4	11.45	42.72
20.2	26.28	50.35	20.2	27.74	46.67	20.2	50.42	59.61	20.3	55.56	45.84	20.4	11.31	42.99
21.2	25.99	50.27	21.2	26.63	46.63	21.2	50.15	59.56	21.3	55.34	46.01	21.4	11.17	43.24
22.2	25.71	50.18	22.2	25.58	46.59	22.2	49.87	59.49	22.3	55.13	46.16	22.4	11.03	43.48
23.2	25.45	50.08	23.2	24.55	46.55	23.2	49.58	59.42	23.3	54.93	46.32	23.4	10.89	43.71
24.2	25.20	49.99	24.2	23.57	46.50	24.2	49.29	59.33	24.3	54.74	46.46	24.4	10.77	43.93
25.2	24.96	49.91	25.2	22.59	46.46	25.2	49.00	59.24	25.3	54.54	46.62	25.4	10.64	44.16
26.2	24.71	49.83	26.2	21.61	46.42	26.2	48.71	59.10	26.3	54.36	46.77	26.4	10.54	44.39
27.2	24.46	49.77	27.2	20.63	46.41	27.2	48.43	58.97	27.3	54.17	46.93	27.4	10.42	44.63
28.2	24.19	49.69	28.2	19.60	46.40	28.2	48.15	58.82	28.3	53.98	47.10	28.4	10.31	44.87
29.2	23.93	49.61	29.2	18.54	46.38	29.2	47.88	58.64	29.3	53.79	47.28	29.4	10.19	45.14
30.2	23.65	49.53	30.2	17.42	46.37	30.2	47.64	58.46	30.3	53.57	47.47	30.4	10.06	45.42
31.2	23.34	49.44	31.2	16.26	46.33	31.2	47.39	58.28	31.3	53.35	47.66	31.4	9.92	45.69
	13.76	+13.72		51.14	+51.13		11.91	−11.87		12.32	+12.28		11.86	+11.81
0^h 57^m $24^s.633$			1^h 31^m $11^s.709$			1^h 41^m $54^s.846$			4^h 10^m $37^s.831$			5^h 35^m $50^s.330$		
+85° 49′ 24″.14			+88° 52′ 20″.55			−85° 10′ 45″.22			+85° 20′ 28″.88			+85° 9′ 34″.51		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			**ζ Mensæ.** Mag. 5.6			**51 H. Cephei.** Mag. 5.3			**25 H. Camelop.** Mag. 5.1			**7 G. Octantis.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	5 45	−84 49	Jan.	6 46	−80 43	Jan.	7 3	+87 10	Jan.	7 14	+82 34	Jan.	7 15	−86 54
	s	″		s	″		s	″		s	″		s	″
0.5	62.10	51.80	0.5	55.72	50.12	0.5	38.28	36.22	0.5	22.01	8.37	0.5	59.12	21.71
1.5	61.97	52.12	1.5	55.70	50.49	1.5	38.46	36.53	1.5	22.10	8.66	1.5	59.07	22.08
2.5	61.87	52.41	2.5	55.68	50.83	2.5	38.64	36.84	2.5	22.19	8.98	2.5	59.01	22.43
3.5	61.74	52.70	3.5	55.65	51.17	3.5	38.79	37.18	3.5	22.27	9.30	3.5	58.95	22.77
4.5	61.63	52.98	4.5	55.62	51.50	4.5	38.92	37.52	4.5	22.33	9.63	4.5	58.89	23.09
5.4	61.51	53.26	5.5	55.59	51.82	5.5	39.02	37.87	5.5	22.38	9.97	5.5	58.85	23.41
6.4	61.40	53.57	6.5	55.58	52.16	6.5	39.08	38.21	6.5	22.42	10.29	6.5	58.82	23.74
7.4	61.29	53.88	7.5	55.56	52.52	7.5	39.12	38.54	7.5	22.43	10.59	7.5	58.79	24.10
8.4	61.18	54.21	8.5	55.53	52.89	8.5	39.13	38.83	8.5	22.45	10.88	8.5	58.76	24.47
9.4	61.05	54.55	9.5	55.50	53.27	9.5	39.16	39.12	9.5	22.48	11.16	9.5	58.72	24.86
10.4	60.91	54.92	10.5	55.46	53.68	10.5	39.21	39.39	10.5	22.51	11.40	10.5	58.66	25.26
11.4	60.76	55.29	11.5	55.42	54.09	11.5	39.27	39.66	11.5	22.55	11.65	11.5	58.57	25.67
12.4	60.58	55.62	12.5	55.38	54.48	12.5	39.35	39.94	12.5	22.59	11.91	12.5	58.44	26.06
13.4	60.39	55.92	13.5	55.32	54.85	13.5	39.43	40.25	13.5	22.64	12.19	13.5	58.29	26.45
14.4	60.21	56.21	14.5	55.25	55.19	14.5	39.53	40.56	14.5	22.70	12.48	14.5	58.13	26.81
15.4	60.03	56.48	15.5	55.19	55.52	15.5	39.60	40.89	15.5	22.75	12.79	15.5	57.96	27.14
16.4	59.86	56.72	16.5	55.12	55.85	16.5	39.64	41.22	16.5	22.76	13.13	16.5	57.80	27.46
17.4	59.69	56.96	17.5	55.06	56.16	17.5	39.65	41.59	17.5	22.78	13.47	17.5	57.65	27.78
18.4	59.53	57.20	18.5	55.01	56.46	18.5	39.61	41.93	18.5	22.78	13.82	18.5	57.51	28.11
19.4	59.38	57.48	19.5	54.96	56.77	19.5	39.55	42.28	19.5	22.77	14.15	19.5	57.38	28.43
20.4	59.21	57.75	20.5	54.90	57.10	20.5	39.46	42.61	20.5	22.76	14.47	20.5	57.26	28.76
21.4	59.04	58.03	21.4	54.85	57.44	21.5	39.38	42.92	21.5	22.73	14.76	21.5	57.14	29.10
22.4	58.87	58.32	22.4	54.79	57.80	22.5	39.28	43.21	22.5	22.70	15.05	22.5	57.01	29.47
23.4	58.69	58.61	23.4	54.73	58.16	23.5	39.18	43.50	23.5	22.67	15.32	23.5	56.84	29.83
24.4	58.51	58.90	24.4	54.64	58.50	24.5	39.08	43.78	24.5	22.66	15.59	24.5	56.67	30.20
25.4	58.30	59.19	25.4	54.57	58.86	25.4	39.02	44.05	25.5	22.64	15.86	25.5	56.48	30.60
26.4	58.08	59.46	26.4	54.49	59.21	26.4	38.95	44.32	26.5	22.62	16.13	26.5	56.27	30.93
27.4	57.86	59.72	27.4	54.41	59.55	27.4	38.89	44.60	27.5	22.61	16.40	27.5	56.04	31.30
28.4	57.63	59.96	28.4	54.32	59.88	28.4	38.83	44.92	28.4	22.61	16.68	28.4	55.80	31.64
29.4	57.40	60.18	29.4	54.22	60.17	29.4	38.77	45.24	29.4	22.61	16.99	29.4	55.53	31.97
30.4	57.18	60.38	30.4	54.13	60.46	30.4	38.69	45.56	30.4	22.60	17.30	30.4	55.27	32.28
31.4	56.96	60.57	31.4	54.04	60.73	31.4	38.58	45.89	31.4	22.56	17.62	31.4	55.00	32.57
	11.10	−11.06		6.21	−6.13		20.31	+20.29		7.73	+7.67		18.54	−18.51
$5^h\ 45^m\ 51^s.396$			$6^h\ 46^m\ 48^s.653$			$7^h\ 3^m\ 2^s.335$			$7^h\ 14^m\ 7^s.912$			$7^h\ 15^m\ 39^s.691$		
−84° 49′ 44″.27			−80° 43′ 46″.14			+87° 10′ 43″.86			+82° 34′ 17″.32			−86° 54′ 19″.75		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	8 19	+88 52	Jan.	9 8	−85 20	Jan.	9 25	+81 40	Jan.	9 36	−80 34	Jan.	10 21	+82 57
	s	″		s	″		s	″		s	″		s	″
0.6	3.23	22.31	0.6	54.14	21.59	0.6	47.94	48.92	0.6	25.48	32.71	0.7	26.98	53.12
1.6	4.00	22.56	1.6	54.25	21.93	1.6	48.09	49.07	1.6	25.56	33.05	1.7	27.18	53.20
2.6	4.77	22.83	2.6	54.36	22.27	2.6	48.24	49.25	2.6	25.62	33.38	2.6	27.37	53.31
3.6	5.51	23.11	3.6	54.46	22.60	3.6	48.38	49.45	3.6	25.69	33.70	3.6	27.56	53.43
4.6	6.19	23.42	4.6	54.56	22.93	4.6	48.52	49.66	4.6	25.76	34.03	4.6	27.75	53.58
5.6	6.78	23.73	5.6	54.65	23.24	5.6	48.65	49.89	5.6	25.83	34.33	5.6	27.94	53.75
6.6	7.29	24.04	6.6	54.75	23.55	6.6	48.75	50.13	6.6	25.90	34.62	6.6	28.09	53.93
7.5	7.72	24.35	7.6	54.88	23.88	7.6	48.86	50.36	7.6	25.98	34.94	7.6	28.23	54.11
8.5	8.10	24.64	8.6	55.01	24.22	8.6	48.95	50.59	8.6	26.06	35.27	8.6	28.37	54.28
9.5	8.48	24.92	9.6	55.14	24.58	9.6	49.04	50.78	9.6	26.14	35.63	9.6	28.50	54.44
10.5	8.88	25.16	10.6	55.25	24.96	10.6	49.13	50.98	10.6	26.23	35.99	10.6	28.64	54.59
11.5	9.31	25.41	11.6	55.36	25.37	11.6	49.23	51.16	11.6	26.31	36.38	11.6	28.78	54.72
12.5	9.79	25.67	12.6	55.44	25.78	12.6	49.35	51.35	12.6	26.37	36.79	12.6	28.93	54.84
13.5	10.32	25.94	13.6	55.50	26.17	13.6	49.46	51.53	13.6	26.43	37.19	13.6	29.10	54.98
14.5	10.86	26.21	14.6	55.55	26.56	14.6	49.59	51.74	14.6	26.48	37.58	14.6	29.27	55.13
15.5	11.39	26.52	15.6	55.59	26.94	15.6	49.72	51.97	15.6	26.53	37.95	15.6	29.44	55.31
16.5	11.85	26.84	16.6	55.62	27.28	16.6	49.82	52.22	16.6	26.57	38.31	16.6	29.59	55.50
17.5	12.24	27.19	17.6	55.66	27.62	17.6	49.92	52.49	17.6	26.61	38.65	17.6	29.75	55.72
18.5	12.55	27.52	18.6	55.70	27.97	18.6	50.02	52.78	18.6	26.65	39.00	18.6	29.90	55.95
19.5	12.76	27.86	19.6	55.75	28.31	19.6	50.10	53.07	19.6	26.69	39.33	19.6	30.03	56.18
20.5	12.92	28.18	20.5	55.80	28.67	20.6	50.17	53.36	20.6	26.74	39.67	20.6	30.14	56.43
21.5	13.04	28.51	21.5	55.86	29.03	21.6	50.23	53.63	21.6	26.79	40.04	21.6	30.25	56.68
22.5	13.13	28.82	22.5	55.92	29.40	22.6	50.29	53.90	22.6	26.84	40.41	22.6	30.35	56.91
23.5	13.21	29.11	23.5	55.98	29.79	23.6	50.34	54.15	23.6	26.89	40.80	23.6	30.45	57.15
24.5	13.31	29.39	24.5	56.03	30.18	24.6	50.39	54.40	24.6	26.93	41.19	24.6	30.55	57.38
25.5	13.42	29.68	25.5	56.06	30.59	25.5	50.45	54.65	25.6	26.97	41.60	25.6	30.65	57.60
26.5	13.56	29.98	26.5	56.07	31.00	26.5	50.52	54.90	26.6	27.01	42.01	26.6	30.77	57.81
27.5	13.73	30.28	27.5	56.08	31.41	27.5	50.59	55.15	27.5	27.04	42.43	27.6	30.88	58.03
28.5	13.91	30.59	28.5	56.08	31.82	28.5	50.67	55.42	28.5	27.05	42.84	28.6	31.01	58.25
29.5	14.10	30.91	29.5	56.05	32.22	29.5	50.75	55.69	29.5	27.06	43.25	29.6	31.13	58.48
30.5	14.25	31.24	30.5	56.01	32.60	30.5	50.83	55.97	30.5	27.07	43.63	30.6	31.25	58.73
31.5	14.37	31.58	31.5	55.97	32.97	31.5	50.89	56.27	31.5	27.08	44.01	31.6	31.36	59.00
	50.89	+50.88		12.31	−12.27		6.91	+6.84		6.11	−6.03		8.16	+8.10
$8^h\ 17^m\ 47^s.546$			$9^h\ 8^m\ 41^s.594$			$9^h\ 25^m\ 39^s.275$			$9^h\ 36^m\ 19^s.026$			$10^h\ 21^m\ 19^s.949$		
+88° 52′ 37″.80			−85° 20′ 26″.78			+81° 41′ 10″.13			−80° 34′ 39″.26			+82° 58′ 17″.67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			**Bradley 1672.** Mag. 6.3			**ι Octantis.** Mag. 5.4			**32 H. Camelop.** *seq.* Mag. 5.3			**κ Octantis.** Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	11 0	−84 9	Jan.	12 14	+88 8	Jan.	12 46	−84 40	Jan.	12 48	+83 50	Jan.	13 27	−85 22
	s	″		s	″		s	″		s	″		s	″
0.7	2.08	18.31	0.7	26.35	29.34	0.8	22.92	47.30	0.8	28.74	45.00	0.8	34.92	4.70
1.7	2.26	18.56	1.7	27.05	29.28	1.8	23.19	47.41	1.8	28.96	44.89	1.8	35.24	4.76
2.7	2.44	18.81	2.7	27.80	29.22	2.7	23.44	47.52	2.8	29.19	44.78	2.8	35.53	4.81
3.7	2.61	19.07	3.7	28.56	29.18	3.7	23.68	47.63	3.7	29.42	44.69	3.8	35.81	4.87
4.7	2.77	19.32	4.7	29.32	29.16	4.7	23.91	47.74	4.7	29.66	44.62	4.8	36.07	4.91
5.7	2.94	19.55	5.7	30.07	29.19	5.7	24.14	47.83	5.7	29.89	44.56	5.8	36.35	4.95
6.7	3.11	19.76	6.7	30.78	29.22	6.7	24.37	47.92	6.7	30.11	44.52	6.8	36.63	4.96
7.7	3.30	19.98	7.7	31.45	29.27	7.7	24.61	48.00	7.7	30.31	44.52	7.8	36.91	4.97
8.7	3.49	20.22	8.7	32.08	29.32	8.7	24.88	48.08	8.7	30.51	44.51	8.8	37.23	5.01
9.7	3.68	20.49	9.7	32.67	29.37	9.7	25.16	48.20	9.7	30.70	44.51	9.8	37.56	5.05
10.7	3.89	20.77	10.7	33.25	29.39	10.7	25.45	48.33	10.7	30.88	44.48	10.8	37.89	5.10
11.7	4.09	21.08	11.7	33.84	29.40	11.7	25.74	48.48	11.7	31.07	44.45	11.8	38.24	5.19
12.6	4.27	21.41	12.7	34.44	29.41	12.7	26.03	48.66	12.7	31.26	44.41	12.7	38.58	5.32
13.6	4.45	21.75	13.7	35.09	29.41	13.7	26.30	48.86	13.7	31.46	44.35	13.7	38.92	5.45
14.6	4.59	22.08	14.7	35.79	29.42	14.7	26.54	49.06	14.7	31.69	44.30	14.7	39.22	5.59
15.6	4.73	22.40	15.7	36.52	29.46	15.7	26.78	49.26	15.7	31.92	44.28	15.7	39.51	5.73
16.6	4.87	22.70	16.7	37.25	29.52	16.7	27.01	49.45	16.7	32.16	44.27	16.7	39.79	5.86
17.6	4.99	22.99	17.7	37.98	29.61	17.7	27.22	49.63	17.7	32.38	44.30	17.7	40.06	5.98
18.6	5.12	23.27	18.7	38.69	29.72	18.7	27.44	49.80	18.7	32.61	44.33	18.7	40.33	6.09
19.6	5.26	23.54	19.7	39.36	29.85	19.7	27.67	49.95	19.7	32.83	44.39	19.7	40.60	6.18
20.6	5.41	23.82	20.7	39.98	29.97	20.7	27.89	50.10	20.7	33.03	44.48	20.7	40.88	6.27
21.6	5.56	24.11	21.7	40.58	30.10	21.7	28.13	50.27	21.7	33.22	44.55	21.7	41.17	6.38
22.6	5.71	24.43	22.7	41.15	30.23	22.7	28.38	50.44	22.7	33.41	44.64	22.7	41.49	6.49
23.6	5.87	24.74	23.7	41.71	30.36	23.7	28.63	50.63	23.7	33.60	44.72	23.7	41.80	6.62
24.6	6.02	25.07	24.7	42.26	30.49	24.7	28.89	50.83	24.7	33.78	44.80	24.7	42.11	6.75
25.6	6.17	25.43	25.7	42.81	30.59	25.7	29.14	51.06	25.7	33.96	44.86	25.7	42.42	6.89
26.6	6.31	25.79	26.7	43.37	30.71	26.7	29.39	51.29	26.7	34.15	44.93	26.7	42.74	7.08
27.6	6.45	26.16	27.7	43.96	30.82	27.7	29.63	51.55	27.7	34.34	44.99	27.7	43.05	7.28
28.6	6.56	26.53	28.7	44.55	30.93	28.7	29.87	51.82	28.7	34.54	45.05	28.7	43.34	7.49
29.6	6.66	26.90	29.7	45.19	31.06	29.7	30.09	52.09	29.7	34.75	45.11	29.7	43.63	7.70
30.6	6.76	27.27	30.6	45.83	31.20	30.7	30.29	52.35	30.7	34.97	45.19	30.7	43.89	7.91
31.6	6.85	27.61	31.6	46.48	31.35	31.7	30.49	52.62	31.7	35.19	45.28	31.7	44.14	8.12
9.82		−9.77	30.83		+30.82	10.79		−10.74	9.33		+9.27	12.38		−12.34
10^h	59^m	$54^s.546$	12^h	14^m	$29^s.190$	12^h	46^m	$19^s.119$	12^h	48^m	$31^s.308$	13^h	27^m	$32^s.891$
−84°	9′	29″.33	+88°	8′	56″.19	−84°	41′	1″.57	+83°	51′	11″.30	−85°	22′	19″.48

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			**Groombridge 2283.** Mag. 7.2			**ρ Octantis.** Mag. 5.7			**ε Ursæ Minoris.** Mag. 4.4			**59 G. Apodis.** Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	14 13	−83 17	Jan.	15 2	+87 32	Jan.	15 24	−84 11	Jan.	16 54	+82 10	Jan.	17 16	−80 46
	s	″		s	″		s	″		s	″		s	″
0.8	46.34	39.91	0.8	33.48	23.92	0.9	20.27	42.02	0.9	1.43	13.83	0.9	13.29	65.42
1.8	46.56	39.90	1.8	33.83	23.65	1.9	20.51	41.89	1.9	1.48	13.46	1.9	13.40	65.17
2.8	46.76	39.89	2.8	34.20	23.39	2.9	20.73	41.76	2.9	1.52	13.08	2.9	13.50	64.93
3.8	46.96	39.88	3.8	34.61	23.12	3.9	20.93	41.64	3.9	1.58	12.69	3.9	13.60	64.70
4.8	47.16	39.87	4.8	35.03	22.87	4.9	21.13	41.52	4.9	1.67	12.34	4.9	13.70	64.48
5.8	47.35	39.86	5.8	35.47	22.64	5.9	21.34	41.40	5.9	1.74	12.00	5.9	13.79	64.24
6.8	47.54	39.82	6.8	35.91	22.44	6.8	21.54	41.27	6.9	1.82	11.67	6.9	13.87	64.00
7.8	47.74	39.78	7.8	36.35	22.26	7.8	21.74	41.13	7.9	1.91	11.37	7.9	13.96	63.73
8.8	47.96	39.73	8.8	36.76	22.09	8.8	21.97	40.98	8.9	1.99	11.09	8.9	14.05	63.45
9.8	48.18	39.69	9.8	37.14	21.92	9.8	22.20	40.83	9.9	2.07	10.83	9.9	14.15	63.17
10.8	48.42	39.67	10.8	37.50	21.75	10.8	22.47	40.68	10.9	2.13	10.57	10.9	14.28	62.89
11.8	48.67	39.67	11.8	37.85	21.58	11.8	22.74	40.56	11.9	2.20	10.31	11.9	14.40	62.61
12.8	48.92	39.72	12.8	38.22	21.39	12.8	23.02	40.47	12.9	2.28	10.02	12.9	14.54	62.37
13.8	49.15	39.77	13.8	38.61	21.19	13.8	23.29	40.41	13.9	2.36	9.71	13.9	14.69	62.14
14.8	49.38	39.85	14.8	39.03	20.97	14.8	23.54	40.36	14.9	2.44	9.40	14.9	14.83	61.95
15.8	49.60	39.94	15.8	39.49	20.76	15.8	23.79	40.32	15.9	2.52	9.07	15.9	14.97	61.76
16.8	49.80	40.00	16.8	39.96	20.56	16.8	24.03	40.28	16.9	2.63	8.75	16.9	15.09	61.57
17.8	50.00	40.05	17.8	40.46	20.37	17.8	24.26	40.23	17.9	2.74	8.43	17.9	15.20	61.40
18.8	50.20	40.10	18.8	40.98	20.23	18.8	24.48	40.18	18.9	2.85	8.14	18.9	15.31	61.21
19.8	50.39	40.14	19.8	41.49	20.09	19.8	24.70	40.12	19.9	2.96	7.86	19.9	15.42	61.01
20.8	50.59	40.18	20.8	41.97	19.99	20.8	24.93	40.04	20.9	3.09	7.61	20.9	15.53	60.79
21.8	50.81	40.21	21.8	42.45	19.89	21.8	25.16	39.96	21.9	3.20	7.38	21.9	15.64	60.57
22.8	51.03	40.26	22.8	42.92	19.80	22.8	25.40	39.88	22.9	3.31	7.15	22.9	15.77	60.34
23.8	51.26	40.30	23.8	43.37	19.72	23.8	25.67	39.82	23.9	3.42	6.93	23.9	15.91	60.12
24.7	51.48	40.38	24.8	43.82	19.63	24.8	25.94	39.76	24.9	3.53	6.73	24.9	16.05	59.90
25.7	51.72	40.46	25.8	44.26	19.53	25.8	26.20	39.72	25.9	3.65	6.52	25.9	16.19	59.69
26.7	51.96	40.56	26.8	44.70	19.44	26.8	26.48	39.70	26.9	3.76	6.30	26.9	16.34	59.49
27.7	52.20	40.69	27.8	45.16	19.35	27.8	26.75	39.70	27.9	3.87	6.06	27.9	16.49	59.31
28.7	52.42	40.83	28.8	45.63	19.24	28.8	27.03	39.72	28.8	3.99	5.81	28.9	16.66	59.17
29.7	52.64	40.97	29.8	46.11	19.12	29.8	27.31	39.75	29.8	4.11	5.56	29.9	16.81	59.02
30.7	52.84	41.12	30.8	46.62	19.01	30.8	27.54	39.79	30.8	4.24	5.29	30.9	16.97	58.89
31.7	53.04	41.26	31.8	47.15	18.91	31.8	27.79	39.83	31.8	4.37	5.04	31.9	17.12	58.77
	8.56	−8.50		23.29	+23.27		9.89	−9.84		7.34	+7.27		6.24	−6.16
14^h	13^m	$46^s.350$	15^h	3^m	$2^s.510$	15^h	24^m	$23^s.351$	16^h	54^m	$12^s.991$	17^h	16^m	$17^s.234$
−83°	17′	54″.52	+87°	32′	42″.66	−84°	11′	55″.43	+82°	10′	21″.42	−80°	47′	14″.27

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	17 57	+86 36	Jan.	18 7	−87 39	Jan.	18 58	+89 1	Jan.	19 29	−89 13	Jan.	20 48	+82 14
	s	″		s	″		s	″		s	″		s	″
0.9	53.00	50.84	0.9	2.14	44.60	1.0	34.74	19.75	1.0	38.48	12.28	1.1	23.38	14.61
1.9	52.99	50.48	1.9	2.42	44.29	2.0	34.29	19.43	2.0	38.68	11.92	2.1	23.27	14.34
2.9	52.98	50.12	2.9	2.68	43.99	3.0	33.88	19.09	3.0	38.91	11.57	3.1	23.16	14.08
3.9	52.99	49.73	3.9	2.93	43.70	4.0	33.53	18.72	4.0	39.11	11.24	4.1	23.04	13.79
4.9	53.03	49.35	4.9	3.18	43.42	5.0	33.27	18.36	5.0	39.27	10.92	5.1	22.94	13.48
5.9	53.10	49.00	5.9	3.41	43.13	5.9	33.11	18.02	6.0	39.37	10.59	6.1	22.86	13.16
6.9	53.19	48.67	6.9	3.61	42.81	6.9	33.04	17.68	7.0	39.40	10.26	7.1	22.77	12.86
7.9	53.27	48.34	7.9	3.82	42.50	7.9	33.00	17.36	8.0	39.41	9.90	8.1	22.71	12.57
8.9	53.36	48.05	8.9	4.05	42.17	8.9	33.00	17.05	9.0	39.47	9.53	9.1	22.65	12.29
9.9	53.45	47.76	9.9	4.33	41.82	9.9	32.97	16.76	10.0	39.61	9.13	10.1	22.59	12.02
10.9	53.52	47.48	10.9	4.65	41.47	10.9	32.90	16.47	11.0	39.85	8.72	11.1	22.53	11.77
11.9	53.58	47.19	11.9	5.00	41.12	11.9	32.77	16.19	12.0	40.24	8.32	12.1	22.46	11.53
12.9	53.63	46.88	12.9	5.40	40.79	12.9	32.60	15.88	13.0	40.78	7.94	13.1	22.38	11.28
13.9	53.68	46.55	13.9	5.81	40.50	13.9	32.42	15.56	13.9	41.38	7.57	14.1	22.30	11.00
14.9	53.75	46.22	14.9	6.23	40.21	14.9	32.27	15.22	14.9	42.03	7.20	15.0	22.23	10.72
15.9	53.84	45.87	15.9	6.63	39.94	15.9	32.18	14.88	15.9	42.66	6.86	16.0	22.15	10.41
16.9	53.96	45.52	16.9	7.01	39.70	16.9	32.19	14.51	16.9	43.24	6.54	17.0	22.08	10.09
17.9	54.09	45.17	17.9	7.35	39.46	17.9	32.28	14.16	17.9	43.77	6.22	18.0	22.02	9.74
18.9	54.24	44.84	18.9	7.68	39.20	18.9	32.47	13.82	18.9	44.23	5.92	19.0	21.97	9.39
19.9	54.42	44.53	19.9	8.00	38.93	19.9	32.74	13.48	19.9	44.64	5.59	20.0	21.93	9.05
20.9	54.60	44.24	20.9	8.32	38.64	20.9	33.04	13.15	20.9	45.04	5.26	21.0	21.89	8.72
21.9	54.78	43.96	21.9	8.66	38.35	21.9	33.36	12.84	21.9	45.47	4.92	22.0	21.86	8.39
22.9	54.97	43.68	22.9	9.03	38.06	22.9	33.69	12.55	22.9	45.96	4.55	23.0	21.83	8.07
23.9	55.16	43.41	23.9	9.43	37.74	23.9	34.02	12.25	23.9	46.52	4.18	24.0	21.80	7.78
24.9	55.33	43.14	24.9	9.85	37.43	24.9	34.31	11.96	24.9	47.16	3.81	25.0	21.79	7.48
25.9	55.50	42.88	25.9	10.30	37.14	25.9	34.60	11.68	25.9	47.90	3.45	26.0	21.77	7.19
26.9	55.65	42.62	26.9	10.77	36.86	26.9	34.86	11.40	26.9	48.74	3.10	27.0	21.74	6.89
27.9	55.82	42.35	27.9	11.28	36.60	27.9	35.09	11.11	27.9	49.65	2.75	28.0	21.71	6.58
28.9	55.99	42.07	28.9	11.79	36.36	28.9	35.33	10.80	28.9	50.63	2.42	29.0	21.68	6.26
29.9	56.18	41.78	29.9	12.30	36.13	29.9	35.60	10.48	29.9	51.65	2.09	30.0	21.65	5.93
30.9	56.37	41.48	30.9	12.81	35.93	30.9	35.92	10.15	30.9	52.65	1.78	31.0	21.62	5.60
31.9	56.58	41.18	31.9	13.29	35.73	31.9	36.31	9.81	31.9	53.62	1.47	32.0	21.61	5.23
	16.93	+16.90		24.50	−24.48		58.52	+58.51		73.32	−73.32		7.40	+7.34
17^h 58^m $22^s.311$			18^h 7^m $23^s.343$			19^h 0^m $15^s.079$			19^h 30^m $50^s.769$			20^h 48^m $32^s.146$		
+86° 36′ 51″.04			−87° 39′ 50″.89			+89° 1′ 12″.80			−89° 13′ 13″.35			+82° 13′ 56″.82		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	21 38	−83 5	Jan.	22 16	−86 22	Jan.	22 37	−81 48	Jan.	23 27	+86 52	Jan.	23 47	−82 28
	s	″		s	″		s	″		s	″		s	″
1.1	32.20	41.36	1.1	21.59	60.03	1.2	47.50	34.96	1.2	40.04	5.16	1.2	20.84	21.41
2.1	32.14	41.08	2.1	21.40	59.77	2.2	47.40	34.71	2.2	39.62	5.13	2.2	20.70	21.24
3.1	32.08	40.80	3.1	21.21	59.50	3.2	47.30	34.46	3.2	39.20	5.09	3.2	20.57	21.08
4.1	32.00	40.52	4.1	21.02	59.26	4.2	47.21	34.23	4.2	38.78	5.04	4.2	20.44	20.93
5.1	31.93	40.25	5.1	20.83	59.02	5.2	47.13	34.02	5.2	38.35	4.95	5.2	20.31	20.79
6.1	31.86	39.99	6.1	20.62	58.76	6.2	47.03	33.81	6.2	37.94	4.85	6.2	20.17	20.65
7.1	31.77	39.71	7.1	20.39	58.50	7.1	46.92	33.60	7.2	37.56	4.72	7.2	20.02	20.52
8.1	31.67	39.42	8.1	20.15	58.24	8.1	46.79	33.37	8.2	37.21	4.60	8.2	19.87	20.38
9.1	31.57	39.11	9.1	19.91	57.96	9.1	46.68	33.12	9.2	36.88	4.48	9.2	19.70	20.22
10.1	31.48	38.79	10.1	19.66	57.65	10.1	46.57	32.85	10.2	36.56	4.37	10.2	19.53	20.04
11.1	31.39	38.44	11.1	19.42	57.33	11.1	46.46	32.56	11.2	36.25	4.27	11.2	19.37	19.83
12.1	31.32	38.07	12.1	19.22	56.99	12.1	46.36	32.24	12.2	35.94	4.19	12.2	19.22	19.61
13.1	31.27	37.69	13.1	19.05	56.63	13.1	46.28	31.92	13.2	35.59	4.12	13.2	19.08	19.37
14.1	31.23	37.34	14.1	18.91	56.29	14.1	46.20	31.60	14.2	35.23	4.04	14.2	18.95	19.13
15.1	31.20	37.00	15.1	18.77	55.96	15.1	46.14	31.30	15.2	34.86	3.95	15.2	18.85	18.88
16.1	31.18	36.66	16.1	18.65	55.64	16.1	46.09	31.01	16.2	34.45	3.81	16.2	18.74	18.63
17.1	31.15	36.34	17.1	18.53	55.33	17.1	46.03	30.73	17.2	34.06	3.65	17.2	18.64	18.41
18.1	31.11	36.04	18.1	18.40	55.02	18.1	45.95	30.45	18.2	33.68	3.48	18.2	18.51	18.19
19.1	31.07	35.73	19.1	18.26	54.73	19.1	45.87	30.19	19.1	33.32	3.29	19.2	18.39	18.00
20.1	31.02	35.44	20.1	18.09	54.43	20.1	45.78	29.93	20.1	32.98	3.09	20.2	18.26	17.79
21.1	30.96	35.13	21.1	17.92	54.14	21.1	45.70	29.66	21.1	32.66	2.89	21.2	18.13	17.59
22.1	30.90	34.80	22.1	17.74	53.83	22.1	45.61	29.37	22.1	32.37	2.69	22.2	17.99	17.37
23.1	30.85	34.45	23.1	17.57	53.50	23.1	45.52	29.08	23.1	32.08	2.50	23.2	17.85	17.14
24.1	30.80	34.09	24.1	17.40	53.15	24.1	45.44	28.76	24.1	31.80	2.31	24.1	17.71	16.90
25.1	30.76	33.73	25.1	17.26	52.79	25.1	45.37	28.43	25.1	31.53	2.14	25.1	17.57	16.63
26.1	30.72	33.35	26.1	17.13	52.41	26.1	45.29	28.07	26.1	31.26	1.96	26.1	17.45	16.36
27.1	30.69	32.97	27.1	17.03	52.03	27.1	45.24	27.70	27.1	30.98	1.79	27.1	17.32	16.07
28.0	30.71	32.58	28.1	16.93	51.65	28.1	45.20	27.34	28.1	30.69	1.62	28.1	17.23	15.76
29.0	30.72	32.20	29.1	16.87	51.26	29.1	45.15	26.99	29.1	30.38	1.43	29.1	17.13	15.45
30.0	30.73	31.84	30.1	16.82	50.89	30.1	45.12	26.65	30.1	30.06	1.24	30.1	17.04	15.14
31.0	30.74	31.50	31.1	16.78	50.53	31.1	45.09	26.31	31.1	29.74	1.02	31.1	16.96	14.85
32.0	30.75	31.16	32.1	16.74	50.20	32.1	45.06	25.99	32.1	29.41	0.79	32.1	16.87	14.56
	8.32	−8.26		15.85	−15.82		7.02	−6.95		18.30	+18.27		7.63	−7.57
21^h 38^m $38^s.548$			22^h 16^m $33^s.212$			22^h 37^m $51^s.624$			23^h 27^m $43^s.571$			23^h 47^m $23^s.637$		
−83° 5′ 34″.33			−86° 22′ 50″.92			−81° 48′ 24″.80			+86° 51′ 38″.62			−82° 28′ 8″.42		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. **Mag. 4.5**			**α Ursæ Minoris.** (*Polaris.*) **Mag. 2.1**			**4 G. Octantis.** **Mag. 5.6**			**Groombridge 750.** **Mag. 6.7**			**Groombridge 944.** **Mag. 6.4**		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	0 57	+85 49	Feb.	1 30	+88 52	Feb.	1 41	−85 10	Feb.	4 10	+85 20	Feb.	5 36	+85 9
	s	″		s	″		s	″		s	″		s	″
0.2	23.34	49.44	0.2	76.26	46.33	0.2	47.39	58.28	0.3	53.35	47.66	0.4	9.92	45.69
1.2	23.04	49.32	1.2	75.09	46.27	1.2	47.16	58.11	1.3	53.11	47.84	1.4	9.74	45.94
2.2	22.75	49.18	2.2	73.91	46.18	2.2	46.93	57.95	2.3	52.86	47.98	2.4	9.56	46.18
3.2	22.47	49.03	3.2	72.77	46.08	3.2	46.69	57.80	3.3	52.59	48.09	3.4	9.36	46.42
4.2	22.20	48.85	4.2	71.70	45.95	4.2	46.45	57.66	4.3	52.34	48.19	4.4	9.15	46.62
5.2	21.96	48.67	5.2	70.71	45.82	5.2	46.17	57.53	5.3	52.09	48.28	5.4	8.96	46.80
6.2	21.73	48.49	6.2	69.80	45.69	6.2	45.88	57.39	6.3	51.85	48.34	6.4	8.77	46.95
7.2	21.53	48.34	7.2	68.93	45.57	7.2	45.60	57.20	7.3	51.64	48.40	7.4	8.60	47.12
8.2	21.32	48.19	8.2	68.08	45.47	8.2	45.32	57.01	8.3	51.44	48.48	8.3	8.45	47.29
9.2	21.12	48.06	9.2	67.21	45.38	9.2	45.04	56.78	9.3	51.23	48.56	9.3	8.30	47.47
10.2	20.89	47.92	10.2	66.29	45.29	10.2	44.79	56.55	10.3	51.03	48.66	10.3	8.15	47.66
11.1	20.65	47.77	11.2	65.30	45.20	11.2	44.55	56.30	11.3	50.81	48.77	11.3	7.98	47.86
12.1	20.38	47.62	12.2	64.25	45.10	12.2	44.33	56.05	12.3	50.57	48.88	12.3	7.80	48.09
13.1	20.12	47.45	13.2	63.18	44.96	13.2	44.13	55.81	13.3	50.31	49.00	13.3	7.61	48.31
14.1	19.85	47.26	14.2	62.09	44.84	14.2	43.91	55.58	14.3	50.03	49.08	14.3	7.38	48.51
15.1	19.60	47.04	15.2	61.03	44.67	15.2	43.69	55.38	15.3	49.75	49.16	15.3	7.14	48.70
16.1	19.36	46.81	16.2	60.02	44.48	16.2	43.48	55.17	16.3	49.47	49.20	16.3	6.91	48.85
17.1	19.12	46 58	17.2	59.06	44.26	17.2	43.26	54.97	17.3	49.19	49.21	17.3	6.67	49.00
18.1	18.93	46.33	18.2	58.15	44.04	18.2	43.02	54.76	18.3	48.92	49.21	18.3	6.42	49.14
19.1	18.73	46.08	19.2	57.30	43.84	19.2	42.78	54.55	19.3	48.64	49.21	19.3	6.18	49.24
20.1	18.54	45.84	20.1	56.50	43.63	20.2	42.54	54.32	20.3	48.40	49.20	20.3	5.95	49.35
21.1	18.37	45.60	21.1	55.73	43.43	21.2	42.29	54.08	21.3	48.15	49.19	21.3	5.73	49.44
22.1	18.20	45.38	22.1	54.97	43.24	22.1	42.05	53.82	22.3	47.92	49.18	22.3	5.53	49.54
23.1	18.03	45.16	23.1	54.22	43.05	23.1	41.81	53.55	23.3	47.69	49.17	23.3	5.33	49.64
24.1	17.86	44.93	24.1	53.45	42.86	24.1	41.59	53.27	24.2	47.46	49.17	24.3	5.12	49.74
25.1	17.68	44.72	25.1	52.66	42.67	25.1	41.39	52.96	25.2	47.22	49.18	25.3	4.92	49.87
26.1	17.49	44.50	26.1	51.81	42.48	26.1	41.19	52.65	26.2	46.99	49.20	26.3	4.70	49.99
27.1	17.29	44.27	27.1	50.93	42.29	27.1	41.00	52.34	27.2	46.72	49.21	27.3	4.48	50.12
28.1	17.09	44.04	28.1	50.05	42.08	28.1	40.83	52.05	28.2	46.46	49.22	28.3	4.25	50.25
29.1	16.88	43.78	29.1	49.16	41.85	29.1	40.65	51.76	29.2	46.17	49.22	29.3	3.98	50.36
30.1	16.69	43.50	30.1	48.31	41.61	30.1	40.47	51.47	30.2	45.89	49.18	30.3	3.72	50.45
31.1	16.51	43.18	31.1	47.53	41.34	31.1	40.30	51.19	31.2	45.60	49.13	31.3	3.45	50.50
13.75 +13.72			51.12 +51.11			11.91 −11.86			12.33 +12.29			11.86 +11.82		
0^h 57^m $24^s.633$			1^h 31^m $11^s.709$			1^h 41^m $54^s.846$			4^h 10^m $37^s.831$			5^h 35^m $50^s.330$		
+85° 49′ 24″.14			+88° 52′ 20″.55			−85° 10′ 45″.22			+85° 20′ 28″.88			+85° 9′ 34″.51		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	5 45	−84 50	Feb.	6 46	−80 44	Feb.	7 3	+87 10	Feb.	7 14	+82 34	Feb.	7 15	−86 54
	s	″		s	″		s	″		s	″		s	″
0.4	56.96	0.57	0.4	54.04	0.73	0.4	38.58	45.89	0.4	22.56	17.62	0.4	55.00	32.57
1.4	56.74	0.76	1.4	53.95	1.00	1.4	38.44	46.22	1.4	22.52	17.95	1.4	54.76	32.85
2.4	56.54	0.96	2.4	53.85	1.27	2.4	38.28	46.54	2.4	22.47	18.28	2.4	54.52	33.14
3.4	56.33	1.16	3.4	53.76	1.55	3.4	38.09	46.85	3.4	22.41	18.59	3.4	54.29	33.45
4.4	56.12	1.39	4.4	53.67	1.86	4.4	37.86	47.14	4.4	22.34	18.88	4.4	54.07	33.76
5.4	55.90	1.63	5.4	53.58	2.17	5.4	37.64	47.39	5.4	22.27	19.13	5.4	53.84	34.09
6.4	55.68	1.87	6.4	53.49	2.49	6.4	37.44	47.63	6.4	22.20	19.36	6.4	53.58	34.44
7.4	55.43	2.11	7.4	53.39	2.83	7.4	37.25	47.87	7.4	22.13	19.59	7.4	53.31	34.79
8.4	55.16	2.35	8.4	53.28	3.15	8.4	37.10	48.10	8.4	22.08	19.82	8.4	53.01	35.13
9.4	54.90	2.55	9.4	53.16	3.45	9.4	36.95	48.36	9.4	22.04	20.05	9.4	52.69	35.46
10.4	54.63	2.73	10.4	53.05	3.73	10.4	36.80	48.62	10.4	22.00	20.31	10.4	52.35	35.76
11.3	54.36	2.89	11.4	52.92	3.97	11.4	36.63	48.89	11.4	21.96	20.59	11.4	52.01	36.05
12.3	54.11	3.03	12.4	52.79	4.20	12.4	36.46	49.17	12.4	21.90	20.88	12.4	51.66	36.32
13.3	53.86	3.16	13.4	52.67	4.42	13.4	36.24	49.47	13.4	21.83	21.18	13.4	51.33	36.56
14.3	53.62	3.29	14.4	52.56	4.64	14.4	35.99	49.77	14.4	21.74	21.47	14.4	51.00	36.81
15.3	53.38	3.43	15.4	52.46	4.86	15.4	35.71	50.05	15.4	21.64	21.75	15.4	50.69	37.06
16.3	53.15	3.57	16.4	52.35	5.08	16.4	35.40	50.32	16.4	21.54	22.02	16.4	50.40	37.33
17.3	52.91	3.72	17.4	52.24	5.32	17.4	35.09	50.56	17.4	21.43	22.27	17.4	50.11	37.60
18.3	52.67	3.90	18.4	52.12	5.57	18.4	34.76	50.80	18.4	21.31	22.50	18.4	49.80	37.89
19.3	52.41	4.05	19.4	51.99	5.84	19.4	34.45	51.01	19.4	21.20	22.72	19.4	49.49	38.17
20.3	52.16	4.21	20.4	51.88	6.10	20.4	34.14	51.21	20.4	21.09	22.92	20.4	49.17	38.45
21.3	51.89	4.37	21.4	51.75	6.37	21.4	33.84	51.41	21.4	20.98	23.12	21.4	48.81	38.74
22.3	51.61	4.52	22.4	51.62	6.61	22.4	33.55	51.60	22.4	20.88	23.31	22.4	48.45	39.02
23.3	51.33	4.67	23.4	51.49	6.83	23.4	33.27	51.80	23.4	20.79	23.52	23.4	48.07	39.29
24.3	51.04	4.79	24.4	51.35	7.05	24.4	33.00	52.01	24.4	20.69	23.74	24.4	47.68	39.54
25.3	50.75	4.89	25.4	51.21	7.25	25.4	32.74	52.23	25.4	20.60	23.96	25.4	47.27	39.78
26.3	50.47	4.98	26.3	51.08	7.43	26.4	32.46	52.46	26.4	20.51	24.19	26.4	46.85	40.01
27.3	50.18	5.04	27.3	50.93	7.59	27.4	32.18	52.69	27.4	20.42	24.42	27.4	46.44	40.21
28.3	49.91	5.08	28.3	50.79	7.74	28.4	31.86	52.93	28.4	20.31	24.65	28.4	46.06	40.41
29.3	49.64	5.13	29.3	50.65	7.90	29.4	31.50	53.15	29.4	20.18	24.90	29.4	45.67	40.59
30.3	49.37	5.22	30.3	50.52	8.05	30.3	31.13	53.36	30.4	20.04	25.11	30.4	45.29	40.78
31.3	49.13	5.30	31.3	50.39	8.23	31.3	30.73	53.55	31.4	19.89	25.31	31.4	44.93	41.00
	11.11	−11.06		6.21	−6.13		20.33	+20.31		7.74	+7.67		18.55	−18.53
	$5^{h}\ 45^{m}\ 51^{s}.396$			$6^{h}\ 46^{m}\ 48^{s}.653$			$7^{h}\ 3^{m}\ 2^{s}.335$			$7^{h}\ 14^{m}\ 7^{s}.912$			$7^{h}\ 15^{m}\ 39^{s}.691$	
		−84° 49′ 44″.27			−80° 43′ 46″.14			+87° 10′ 43″.86			+82° 34′ 17″.32			−86° 54′ 19″.75

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamaeleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	8 19	+88 52	Feb.	9 8	−85 20	Feb.	9 25	+81 40	Feb.	9 36	−80 34	Feb.	10 21	+82 57
	s	″		s	″		s	″		s	″		s	″
0.5	14.37	31.58	0.5	55.97	32.97	0.5	50.89	56.27	0.5	27.08	44.01	0.6	31.36	59.00
1.5	14.40	31.94	1.5	55.94	33.31	1.5	50.95	56.60	1.5	27.09	44.36	1.6	31.47	59.28
2.5	14.37	32.30	2.5	55.92	33.66	2.5	50.99	56.93	2.5	27.09	44.70	2.6	31.57	59.57
3.5	14.23	32.64	3.5	55.91	34.02	3.5	51.03	57.26	3.5	27.10	45.07	3.6	31.65	59.87
4.5	14.03	32.97	4.5	55.90	34.38	4.5	51.04	57.56	4.5	27.12	45.44	4.6	31.71	60.16
5.5	13.80	33.26	5.5	55.89	34.75	5.5	51.05	57.85	5.5	27.14	45.84	5.6	31.77	60.44
6.5	13.57	33.55	6.5	55.88	35.17	6.5	51.07	58.13	6.5	27.15	46.25	6.6	31.83	60.72
7.5	13.37	33.82	7.5	55.87	35.59	7.5	51.09	58.39	7.5	27.17	46.67	7.6	31.88	60.97
8.5	13.22	34.08	8.5	55.82	36.03	8.5	51.12	58.65	8.5	27.18	47.11	8.5	31.94	61.21
9.5	13.13	34.36	9.5	55.77	36.45	9.5	51.16	58.91	9.5	27.18	47.55	9.5	32.02	61.45
10.5	13.06	34.65	10.5	55.68	36.86	10.5	51.20	59.18	10.5	27.17	47.97	10.5	32.11	61.71
11.5	12.98	34.97	11.5	55.59	37.24	11.5	51.24	59.46	11.5	27.15	48.37	11.5	32.20	61.98
12.5	12.86	35.29	12.5	55.49	37.61	12.5	51.27	59.78	12.5	27.13	48.74	12.5	32.28	62.26
13.4	12.67	35.63	13.5	55.39	37.94	13.5	51.31	60.10	13.5	27.10	49.11	13.5	32.34	62.57
14.4	12.40	35.97	14.5	55.31	38.28	14.5	51.32	60.44	14.5	27.07	49.47	14.5	32.41	62.89
15.4	12.04	36.31	15.5	55.22	38.62	15.5	51.31	60.78	15.5	27.04	49.83	15.5	32.46	63.23
16.4	11.60	36.64	16.5	55.15	38.98	16.5	51.30	61.11	16.5	27.03	50.19	16.5	32.49	63.56
17.4	11.13	36.93	17.5	55.09	39.34	17.5	51.28	61.44	17.5	27.02	50.57	17.5	32.50	63.89
18.4	10.62	37.22	18.5	55.02	39.70	18.5	51.25	61.75	18.5	27.01	50.95	18.5	32.52	64.21
19.4	10.10	37.51	19.5	54.94	40.07	19.5	51.22	62.04	19.5	26.99	51.32	19.5	32.53	64.52
20.4	9.58	37.79	20.5	54.86	40.45	20.5	51.19	62.33	20.5	26.97	51.72	20.5	32.54	64.83
21.4	9.10	38.06	21.5	54.77	40.84	21.5	51.18	62.62	21.5	26.95	52.13	21.5	32.55	65.12
22.4	8.62	38.31	22.5	54.67	41.24	22.5	51.17	62.89	22.5	26.92	52.53	22.5	32.57	65.40
23.4	8.18	38.57	23.5	54.56	41.63	23.5	51.15	63.16	23.5	26.89	52.92	23.5	32.59	65.68
24.4	7.75	38.84	24.5	54.43	42.02	24.5	51.13	63.44	24.5	26.85	53.31	24.5	32.60	65.96
25.4	7.35	39.11	25.5	54.29	42.40	25.5	51.13	63.73	25.5	26.80	53.71	25.5	32.64	66.25
26.4	6.94	39.40	26.4	54.13	42.74	26.5	51.12	64.02	26.5	26.75	54.10	26.5	32.67	66.56
27.4	6.49	39.69	27.4	53.97	43.08	27.5	51.11	64.34	27.5	26.69	54.47	27.5	32.70	66.88
28.4	5.97	39.99	28.4	53.82	43.42	28.5	51.08	64.67	28.5	26.64	54.81	28.5	32.71	67.20
29.4	5.38	40.29	29.4	53.67	43.74	29.5	51.05	64.99	29.5	26.58	55.15	29.5	32.72	67.54
30.4	4.71	40.58	30.4	53.52	44.06	30.4	51.00	65.31	30.5	26.52	55.48	30.5	32.71	67.89
31.4	3.98	40.86	31.4	53.39	44.37	31.4	50.95	65.63	31.5	26.47	55.82	31.5	32.67	68.23
	51.01	+51.00		12.32	−12.28		6.91	+6.84		6.11	−6.03		8.17	+8.11
$8^h\ 17^m\ 47^s.546$			$9^h\ 8^m\ 41^s.594$			$9^h\ 25^m\ 39^s.275$			$9^h\ 36^m\ 19^s.026$			$10^h\ 21^m\ 19^s.949$		
+88° 52′ 37″.80			−85° 20′ 26″.78			+81° 41′ 10″.13			−80° 34′ 39″.26			+82° 58′ 17″.67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			**Bradley 1672.** Mag. 6.3			**ι Octantis.** Mag. 5.4			**32 H. Camelop.** *seq.* Mag. 5.3			**κ Octantis.** Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	11 0	−84 9	Feb.	12 14	+88 8	Feb.	12 46	−84 40	Feb.	12 48	+83 50	Feb.	13 27	−85 22
	s	″		s	″		s	″		s	″		s	″
0.6	6.85	27.61	0.6	46.48	31.35	0.7	30.49	52.62	0.7	35.19	45.28	0.7	44.14	8.12
1.6	6.93	27.95	1.6	47.11	31.53	1.7	30.67	52.86	1.7	35.39	45.40	1.7	44.38	8.32
2.6	7.01	28.28	2.6	47.73	31.72	2.7	30.86	53.10	2.7	35.59	45.53	2.7	44.63	8.51
3.6	7.10	28.61	3.6	48.29	31.92	3.7	31.06	53.33	3.7	35.78	45.70	3.7	44.90	8.68
4.6	7.21	28.94	4.6	48.80	32.13	4.7	31.28	53.55	4.7	35.96	45.87	4.7	45.16	8.85
5.6	7.34	29.30	5.6	49.26	32.34	5.7	31.50	53.79	5.7	36.11	46.04	5.7	45.44	9.02
6.6	7.46	29.67	6.6	49.68	32.55	6.7	31.72	54.06	6.7	36.26	46.19	6.7	45.75	9.22
7.6	7.57	30.05	7.6	50.11	32.74	7.7	31.96	54.35	7.7	36.42	46.35	7.7	46.06	9.44
8.6	7.67	30.47	8.6	50.56	32.90	8.6	32.19	54.67	8.6	36.59	46.49	8.7	46.36	9.68
9.6	7.76	30.88	9.6	51.02	33.07	9.6	32.41	54.99	9.6	36.76	46.61	9.7	46.65	9.96
10.6	7.82	31.30	10.6	51.53	33.25	10.6	32.61	55.32	10.6	36.93	46.74	10.7	46.93	10.25
11.6	7.88	31.71	11.6	52.07	33.44	11.6	32.80	55.64	11.6	37.11	46.87	11.7	47.17	10.54
12.6	7.93	32.09	12.6	52.62	33.64	12.6	32.97	55.97	12.6	37.29	47.03	12.7	47.40	10.81
13.6	7.97	32.47	13.6	53.17	33.86	13.6	33.12	56.28	13.6	37.49	47.21	13.7	47.62	11.07
14.6	8.01	32.84	14.6	53.69	34.10	14.6	33.27	56.57	14.6	37.67	47.40	14.7	47.84	11.34
15.6	8.06	33.18	15.6	54.17	34.37	15.6	33.42	56.86	15.6	37.84	47.62	15.7	48.06	11.58
16.6	8.10	33.54	16.6	54.60	34.65	16.6	33.60	57.14	16.6	37.99	47.85	16.7	48.28	11.80
17.5	8.16	33.90	17.6	55.00	34.93	17.6	33.76	57.42	17.6	38.15	48.09	17.7	48.51	12.03
18.5	8.22	34.26	18.6	55.36	35.21	18.6	33.94	57.70	18.6	38.28	48.33	18.6	48.76	12.26
19.5	8.28	34.64	19.6	55.69	35.49	19.6	34.12	57.99	19.6	38.41	48.57	19.6	49.00	12.53
20.5	8.34	35.03	20.6	56.02	35.77	20.6	34.31	58.30	20.6	38.53	48.82	20.6	49.25	12.79
21.5	8.40	35.44	21.6	56.34	36.02	21.6	34.49	58.62	21.6	38.65	49.06	21.6	49.50	13.07
22.5	8.46	35.85	22.6	56.66	36.27	22.6	34.67	58.97	22.6	38.78	49.28	22.6	49.76	13.36
23.5	8.50	36.26	23.6	56.98	36.51	23.6	34.84	59.33	23.6	38.91	49.48	23.6	50.00	13.67
24.5	8.52	36.67	24.6	57.32	36.75	24.6	35.00	59.70	24.6	39.04	49.68	24.6	50.23	13.99
25.5	8.53	37.09	25.6	57.69	36.99	25.6	35.15	60.06	25.6	39.18	49.89	25.6	50.46	14.32
26.5	8.53	37.50	26.6	58.06	37.25	26.6	35.28	60.43	26.6	39.32	50.11	26.6	50.65	14.65
27.5	8.53	37.88	27.6	58.44	37.52	27.6	35.41	60.79	27.6	39.47	50.34	27.6	50.84	14.98
28.5	8.53	38.27	28.6	58.82	37.80	28.6	35.51	61.14	28.6	39.61	50.58	28.6	51.02	15.31
29.5	8.52	38.64	29.6	59.17	38.11	29.6	35.61	61.48	29.6	39.74	50.86	29.6	51.19	15.62
30.5	8.52	39.00	30.6	59.48	38.43	30.6	35.74	61.81	30.6	39.85	51.14	30.6	51.37	15.92
31.5	8.52	39.36	31.6	59.72	38.76	31.6	35.86	62.14	31.6	39.96	51.45	31.6	51.56	16.21
9.83		−9.78	30.86		+30.84	10.79		−10.74	9.33		+9.28	12.39		−12.35
10^h	59^m	$54^s.546$	12^h	14^m	$29^s.190$	12^h	46^m	$19^s.119$	12^h	48^m	$31^s.308$	13^h	27^m	$32^s.891$
−84°	9′	29″.33	+88°	8′	56″.19	−84°	41′	1″.57	+83°	51′	11″.30	−85°	22′	19″.48

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			**Groombridge 2283.** Mag. 7.2			**ρ Octantis.** Mag. 5.7			**ε Ursæ Minoris.** Mag. 4.4			**59 G. Apodis.** Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	14 13	−83 17	Feb.	15 2	+87 32	Feb.	15 24	−84 11	Feb.	16 54	+82 10	Feb.	17 16	−80 46
	s	″		s	″		s	″		s	″		s	″
0.7	53.04	41.26	0.8	47.15	18.91	0.8	27.79	39.83	0.8	4.37	5.04	0.9	17.12	58.77
1.7	53.24	41.40	1.8	47.70	18.84	1.8	28.03	39.88	1.8	4.51	4.80	1.9	17.25	58.64
2.7	53.42	41.53	2.8	48.26	18.79	2.8	28.26	39.90	2.8	4.66	4.60	2.9	17.39	58.51
3.7	53.61	41.64	3.8	48.79	18.78	3.8	28.50	39.91	3.8	4.80	4.40	3.8	17.52	58.36
4.7	53.81	41.75	4.8	49.30	18.77	4.8	28.74	39.91	4.8	4.95	4.23	4.8	17.65	58.20
5.7	54.04	41.88	5.7	49.78	18.77	5.8	29.01	39.91	5.8	5.10	4.10	5.8	17.80	58.03
6.7	54.26	42.00	6.7	50.25	18.78	6.8	29.28	39.91	6.8	5.23	3.96	6.8	17.95	57.86
7.7	54.50	42.15	7.7	50.68	18.79	7.8	29.55	39.94	7.8	5.36	3.82	7.8	18.12	57.69
8.7	54.74	42.33	8.7	51.11	18.78	8.8	29.85	39.99	8.8	5.50	3.68	8.8	18.30	57.54
9.7	54.97	42.53	9.7	51.57	18.74	9.8	30.14	40.06	9.8	5.63	3.50	9.8	18.48	57.42
10.7	55.18	42.75	10.7	52.04	18.70	10.8	30.43	40.15	10.8	5.77	3.32	10.8	18.66	57.33
11.7	55.39	42.97	11.7	52.55	18.67	11.7	30.70	40.28	11.8	5.90	3.14	11.8	18.84	57.26
12.7	55.59	43.20	12.7	53.07	18.65	12.7	30.95	40.39	12.8	6.05	2.95	12.8	19.00	57.20
13.7	55.77	43.40	13.7	53.63	18.65	13.7	31.18	40.50	13.8	6.20	2.77	13.8	19.15	57.14
14.7	55.94	43.60	14.7	54.18	18.66	14.7	31.41	40.59	14.8	6.38	2.62	14.8	19.30	57.06
15.7	56.11	43.79	15.7	54.72	18.70	15.7	31.64	40.69	15.8	6.54	2.49	15.8	19.44	56.98
16.7	56.29	43.96	16.7	55.25	18.75	16.7	31.87	40.75	16.8	6.71	2.38	16.8	19.58	56.89
17.7	56.48	44.13	17.7	55.77	18.85	17.7	32.11	40.82	17.8	6.88	2.29	17.8	19.72	56.80
18.7	56.66	44.31	18.7	56.26	18.94	18.7	32.35	40.89	18.8	7.03	2.22	18.8	19.88	56.70
19.7	56.86	44.51	19.7	56.74	19.03	19.7	32.60	40.97	19.8	7.19	2.16	19.8	20.03	56.60
20.7	57.06	44.71	20.7	57.21	19.11	20.7	32.87	41.05	20.8	7.34	2.10	20.8	20.21	56.50
21.7	57.26	44.93	21.7	57.66	19.20	21.7	33.13	41.15	21.8	7.49	2.05	21.8	20.37	56.40
22.7	57.47	45.15	22.7	58.10	19.29	22.7	33.40	41.26	22.8	7.64	1.99	22.8	20.55	56.33
23.7	57.68	45.39	23.7	58.55	19.37	23.7	33.67	41.39	23.8	7.79	1.91	23.8	20.72	56.27
24.7	57.87	45.66	24.7	59.00	19.44	24.7	33.94	41.55	24.8	7.94	1.83	24.8	20.91	56.23
25.7	58.06	45.94	25.7	59.46	19.50	25.7	34.21	41.72	25.8	8.09	1.75	25.8	21.10	56.21
26.7	58.24	46.21	26.7	59.94	19.56	26.7	34.45	41.89	26.8	8.25	1.66	26.8	21.27	56.21
27.7	58.41	46.49	27.7	60.45	19.64	27.7	34.69	42.07	27.8	8.42	1.58	27.8	21.44	56.21
28.7	58.56	46.76	28.7	60.96	19.73	28.7	34.92	42.25	28.8	8.59	1.51	28.8	21.59	56.22
29.7	58.71	47.03	29.7	61.47	19.85	29.7	35.13	42.42	29.8	8.77	1.45	29.8	21.75	56.21
30.6	58.86	47.27	30.7	61.98	19.98	30.7	35.35	42.57	30.8	8.94	1.42	30.8	21.89	56.20
31.6	59.03	47.49	31.7	62.46	20.15	31.7	35.57	42.72	31.8	9.11	1.42	31.8	22.04	56.17
	8.57	−8.51		23.28	+23.26		9.89	−9.84		7.34	+7.27		6.24	−6.16
	14ʰ 13ᵐ	46ˢ.350		15ʰ 3ᵐ	2ˢ.510		15ʰ 24ᵐ	23ˢ.351		16ʰ 54ᵐ	12ˢ.991		17ʰ 16ᵐ	17ˢ.234
	−83° 17′	54″.52		+87° 32′	42″.66		−84° 11′	55″.43		+82° 10′	21″.42		−80° 47′	14″.[illegible]

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursae Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursae Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	17 57	+86 36	Feb.	18 7	−87 39	Feb.	18 58	+89 1	Feb.	19 29	−89 12	Feb.	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
0.9	56.58	41.18	0.9	13.29	35.73	0.9	36.31	9.81	0.9	53.62	61.47	1.0	21.61	65.23
1.9	56.81	40.89	1.9	13.75	35.51	1.9	36.80	9.48	1.9	54.54	61.16	2.0	21.59	64.86
2.9	57.08	40.61	2.9	14.18	35.29	2.9	37.37	9.15	2.9	55.39	60.86	2.9	21.58	64.50
3.9	57.35	40.36	3.9	14.61	35.06	3.9	38.00	8.85	3.9	56.19	60.55	3.9	21.58	64.16
4.9	57.62	40.12	4.9	15.06	34.82	4.9	38.67	8.56	4.9	56.99	60.23	4.9	21.59	63.83
5.9	57.87	39.91	5.9	15.52	34.57	5.9	39.34	8.31	5.9	57.84	59.89	5.9	21.63	63.51
6.9	58.12	39.71	6.9	16.03	34.31	6.9	39.97	8.07	6.9	58.79	59.54	6.9	21.66	63.21
7.9	58.37	39.52	7.9	16.59	34.06	7.9	40.55	7.83	7.9	59.86	59.19	7.9	21.67	62.92
8.9	58.60	39.33	8.9	17.18	33.81	8.9	41.07	7.60	8.9	61.07	58.84	8.9	21.68	62.64
9.9	58.83	39.11	9.9	17.78	33.61	9.9	41.57	7.34	9.9	62.37	58.52	9.9	21.70	62.36
10.9	59.06	38.88	10.9	18.39	33.41	10.9	42.07	7.06	10.9	63.73	58.21	10.9	21.71	62.04
11.9	59.30	38.64	11.9	18.99	33.24	11.9	42.61	6.76	11.9	65.09	57.92	11.9	21.71	61.71
12.9	59.57	38.39	12.9	19.56	33.08	12.9	43.23	6.46	12.9	66.40	57.63	12.9	21.72	61.37
13.9	59.85	38.14	13.9	20.10	32.93	13.9	43.95	6.17	13.9	67.64	57.37	13.9	21.74	61.01
14.8	60.17	37.91	14.9	20.62	32.78	14.9	44.75	5.87	14.9	68.81	57.11	14.9	21.77	60.64
15.8	60.49	37.70	15.9	21.13	32.62	15.9	45.63	5.58	15.9	69.92	56.84	15.9	21.81	60.30
16.8	60.83	37.50	16.8	21.63	32.45	16.9	46.56	5.33	16.9	71.01	56.57	16.9	21.86	59.96
17.8	61.16	37.33	17.8	22.14	32.27	17.9	47.49	5.08	17.9	72.11	56.30	17.9	21.91	59.62
18.8	61.50	37.18	18.8	22.66	32.08	18.9	48.44	4.87	18.9	73.23	56.01	18.9	21.97	59.30
19.8	61.83	37.03	19.8	23.21	31.89	19.9	49.39	4.67	19.9	74.42	55.70	19.9	22.03	59.01
20.8	62.15	36.89	20.8	23.78	31.70	20.9	50.29	4.46	20.9	75.67	55.39	20.9	22.09	58.72
21.8	62.46	36.76	21.8	24.37	31.51	21.9	51.19	4.26	21.9	77.01	55.10	21.9	22.16	58.43
22.8	62.78	36.63	22.8	24.99	31.34	22.9	52.05	4.06	22.9	78.43	54.81	22.9	22.21	58.15
23.8	63.09	36.48	23.8	25.64	31.19	23.9	52.89	3.86	23.9	79.94	54.54	23.9	22.27	57.88
24.8	63.38	36.32	24.8	26.29	31.05	24.9	53.71	3.64	24.9	81.50	54.27	24.9	22.33	57.60
25.8	63.68	36.17	25.8	26.94	30.94	25.9	54.54	3.44	25.9	83.10	54.03	25.9	22.39	57.29
26.8	63.99	36.01	26.8	27.58	30.84	26.9	55.40	3.21	26.9	84.70	53.79	26.9	22.44	56.98
27.8	64.32	35.86	27.8	28.21	30.74	27.9	56.31	2.98	27.9	86.27	53.56	27.9	22.49	56.66
28.8	64.66	35.70	28.8	28.81	30.66	28.9	57.30	2.75	28.9	87.79	53.37	28.9	22.55	56.34
29.8	65.03	35.55	29.8	29.37	30.57	29.8	58.36	2.53	29.9	89.23	53.17	29.9	22.64	56.01
30.8	65.41	35.44	30.8	29.94	30.47	30.8	59.50	2.33	30.9	90.60	52.94	30.9	22.72	55.69
31.8	65.78	35.34	31.8	30.50	30.34	31.8	60.67	2.15	31.9	91.96	52.71	31.9	22.81	55.40
	16.91	+16.88		24.48	−24.46		58.36	+58.35		73.06	−73.06		7.40	+7.33
17^{h} 58^{m} $22^{s}.311$			18^{h} 7^{m} $23^{s}.343$			19^{h} 0^{m} $15^{s}.079$			19^{h} 30^{m} $50^{s}.769$			20^{h} 48^{m} $32^{s}.146$		
[illegible] 51″.04			−87° 39′ 50″.89			+89° 1′ 12″.80			−89° 13′ 13″.35			+82° 13′ 56″.82		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. **Mag. 5.4**			**υ Octantis.** **Mag. 5.7**			**β Octantis.** **Mag. 4.3**			**39 H. Cephei.** **Mag. 5.6**			**γ^1 Octantis.** **Mag. 5.1**		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	21 38	−83 5	Feb.	22 16	−86 22	Feb.	22 37	−81 48	Feb.	23 27	+86 51	Feb.	23 47	−82 28
	s	″		s	″		s	″		s	″		s	″
1.0	30.75	31.16	1.1	16.74	50.20	1.1	45.06	25.99	1.1	29.41	60.79	1.1	16.87	14.56
2.0	30.76	30.83	2.1	16.68	49.86	2.1	45.03	25.68	2.1	29.11	60.55	2.1	16.78	14.28
3.0	30.75	30.49	3.1	16.60	49.53	3.1	44.98	25.36	3.1	28.83	60.28	3.1	16.69	14.01
4.0	30.75	30.16	4.1	16.52	49.20	4.1	44.93	25.04	4.1	28.58	60.00	4.1	16.58	13.75
5.0	30.74	29.79	5.1	16.42	48.83	5.1	44.87	24.71	5.1	28.35	59.73	5.1	16.47	13.47
6.0	30.72	29.43	6.1	16.31	48.47	6.1	44.82	24.35	6.1	28.16	59.47	6.1	16.35	13.16
7.0	30.71	29.03	7.0	16.22	48.07	7.1	44.77	23.98	7.1	27.97	59.23	7.1	16.24	12.83
8.0	30.72	28.62	8.0	16.16	47.66	8.1	44.73	23.61	8.1	27.79	59.00	8.1	16.13	12.49
9.0	30.76	28.20	9.0	16.11	47.24	9.1	44.70	23.19	9.1	27.59	58.79	9.1	16.03	12.14
10.0	30.79	27.79	10.0	16.11	46.81	10.1	44.69	22.77	10.1	27.37	58.57	10.1	15.96	11.77
11.0	30.83	27.40	11.0	16.14	46.41	11.1	44.68	22.40	11.1	27.13	58.33	11.1	15.90	11.40
12.0	30.89	27.02	12.0	16.17	46.03	12.0	44.68	22.02	12.1	26.88	58.08	12.1	15.84	11.04
13.0	30.95	26.68	13.0	16.20	45.67	13.0	44.68	21.68	13.1	26.63	57.81	13.1	15.79	10.71
14.0	31.00	26.34	14.0	16.21	45.31	14.0	44.68	21.34	14.1	26.39	57.52	14.1	15.73	10.39
14.9	31.03	25.99	15.0	16.22	44.97	15.0	44.67	21.00	15.1	26.16	57.20	15.1	15.67	10.07
15.9	31.07	25.66	16.0	16.22	44.63	16.0	44.66	20.64	16.1	25.97	56.87	16.1	15.59	9.77
16.9	31.10	25.32	17.0	16.21	44.27	17.0	44.63	20.31	17.1	25.80	56.56	17.1	15.51	9.46
17.9	31.12	24.96	18.0	16.19	43.92	18.0	44.60	19.97	18.1	25.66	56.24	18.1	15.43	9.14
18.9	31.14	24.60	19.0	16.17	43.54	19.0	44.58	19.61	19.1	25.53	55.93	19.1	15.35	8.82
19.9	31.17	24.24	20.0	16.16	43.15	20.0	44.57	19.23	20.1	25.41	55.63	20.1	15.27	8.49
20.9	31.21	23.85	21.0	16.15	42.75	21.0	44.56	18.85	21.1	25.31	55.33	21.1	15.20	8.13
21.9	31.25	23.47	22.0	16.16	42.34	22.0	44.55	18.46	22.1	25.21	55.05	22.1	15.12	7.77
22.9	31.31	23.09	23.0	16.20	41.92	23.0	44.54	18.05	23.1	25.11	54.77	23.1	15.07	7.39
23.9	31.39	22.71	24.0	16.25	41.52	24.0	44.56	17.66	24.1	24.98	54.50	24.1	15.02	6.98
24.9	31.47	22.33	24.9	16.33	41.12	25.0	44.58	17.27	25.0	24.85	54.23	25.1	14.98	6.58
25.9	31.56	21.95	25.9	16.43	40.73	26.0	44.61	16.87	26.0	24.72	53.96	26.1	14.95	6.20
26.9	31.66	21.57	26.9	16.53	40.34	27.0	44.65	16.48	27.0	24.58	53.65	27.1	14.94	5.82
27.9	31.75	21.23	27.9	16.65	39.96	28.0	44.69	16.11	28.0	24.43	53.35	28.1	14.92	5.45
28.9	31.84	20.89	28.9	16.76	39.60	29.0	44.72	15.75	29.0	24.29	53.03	29.1	14.89	5.09
29.9	31.93	20.56	29.9	16.85	39.26	30.0	44.75	15.39	30.0	24.19	52.68	30.0	14.86	4.73
30.9	31.99	20.23	30.9	16.91	38.91	30.9	44.76	15.05	31.0	24.12	52.33	31.0	14.81	4.40
31.9	32.05	19.89	31.9	16.97	38.56	31.9	44.77	14.69	32.0	24.08	51.98	32.0	14.77	4.05
8.31		−8.25	15.83		−15.80	7.02		−6.94	18.29		+18.26	7.63		−7.56
21^h	38^m	$38^s.548$	22^h	16^m	$33^s.212$	22^h	37^m	$51^s.624$	23^h	27^m	$43^s.571$	23^h	47^m	$23^s.637$
−83°	5′	34″.33	−86°	22′	50″.92	−81°	48′	24″.80	+86°	51′	38″.62	−82°	28′	8″.42

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (*Polaris.*) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	0 57	+85 49	Mar.	1 30	+88 52	Mar.	1 41	−85 10	Mar.	4 10	+85 20	Mar.	5 35	+85 9
	s	″		s	″		s	″		s	″		s	″
0.1	17.09	44.04	0.1	50.05	42.08	0.1	40.83	52.05	0.2	46.46	49.22	0.3	64.25	50.25
1.1	16.88	43.78	1.1	49.16	41.85	1.1	40.65	51.76	1.2	46.17	49.22	1.3	63.98	50.36
2.1	16.69	43.50	2.1	48.31	41.61	2.1	40.47	51.47	2.2	45.89	49.18	2.3	63.72	50.45
3.1	16.51	43.18	3.1	47.53	41.34	3.1	40.30	51.19	3.2	45.60	49.13	3.3	63.45	50.50
4.1	16.36	42.89	4.1	46.84	41.06	4.1	40.10	50.94	4.2	45.33	49.05	4.3	63.18	50.55
5.1	16.24	42.59	5.1	46.23	40.79	5.1	39.88	50.67	5.2	45.08	48.95	5.3	62.93	50.57
6.1	16.14	42.30	6.1	45.69	40.52	6.1	39.66	50.39	6.2	44.84	48.85	6.3	62.69	50.57
7.1	16.05	42.03	7.1	45.19	40.28	7.1	39.46	50.08	7.2	44.62	48.75	7.3	62.47	50.57
8.1	15.96	41.76	8.1	44.69	40.05	8.1	39.25	49.76	8.2	44.42	48.68	8.3	62.27	50.61
9.1	15.86	41.51	9.1	44.17	39.83	9.1	39.06	49.42	9.2	44.22	48.61	9.3	62.07	50.63
10.1	15.74	41.26	10.1	43.59	39.61	10.1	38.89	49.05	10.2	43.99	48.54	10.3	61.84	50.68
11.1	15.61	41.00	11.1	42.95	39.37	11.1	38.74	48.68	11.2	43.76	48.48	11.3	61.62	50.73
12.1	15.47	40.73	12.1	42.28	39.13	12.1	38.60	48.33	12.2	43.52	48.42	12.3	61.38	50.80
13.1	15.32	40.45	13.1	41.60	38.87	13.1	38.47	47.99	13.2	43.25	48.34	13.3	61.11	50.85
14.1	15.18	40.14	14.1	40.93	38.58	14.1	38.34	47.67	14.2	42.98	48.25	14.3	60.86	50.87
15.1	15.05	39.82	15.1	40.31	38.27	15.1	38.20	47.36	15.2	42.70	48.14	15.3	60.58	50.86
16.1	14.95	39.47	16.1	39.76	37.96	16.1	38.06	47.07	16.2	42.43	47.99	16.3	60.29	50.87
17.1	14.87	39.13	17.1	39.27	37.64	17.1	37.91	46.76	17.2	42.18	47.82	17.2	60.02	50.84
18.1	14.81	38.79	18.1	38.85	37.30	18.1	37.76	46.45	18.2	41.93	47.65	18.2	59.75	50.79
19.1	14.74	38.46	19.1	38.48	36.97	19.1	37.60	46.14	19.2	41.70	47.48	19.2	59.50	50.73
20.0	14.70	38.13	20.1	38.16	36.66	20.1	37.44	45.82	20.2	41.48	47.30	20.2	59.25	50.67
21.0	14.67	37.83	21.1	37.87	36.36	21.1	37.28	45.48	21.2	41.26	47.13	21.2	59.00	50.61
22.0	14.63	37.52	22.1	37.58	36.07	22.1	37.13	45.12	22.2	41.07	46.96	22.2	58.78	50.55
23.0	14.60	37.23	23.1	37.27	35.80	23.1	36.98	44.75	23.2	40.88	46.81	23.2	58.56	50.49
24.0	14.56	36.94	24.1	36.98	35.53	24.1	36.85	44.38	24.2	40.68	46.66	24.2	58.34	50.44
25.0	14.53	36.67	25.1	36.67	35.25	25.1	36.75	43.99	25.2	40.49	46.51	25.2	58.12	50.39
26.0	14.48	36.39	26.1	36.30	34.97	26.1	36.65	43.61	26.2	40.26	46.37	26.2	57.90	50.35
27.0	14.41	36.08	27.1	35.92	34.68	27.1	36.56	43.24	27.2	40.05	46.22	27.2	57.66	50.32
28.0	14.35	35.76	28.0	35.53	34.37	28.1	36.48	42.87	28.2	39.83	46.07	28.2	57.41	50.27
29.0	14.30	35.43	29.0	35.19	34.05	29.1	36.41	42.52	29.2	39.59	45.89	29.2	57.14	50.22
30.0	14.26	35.09	30.0	34.89	33.72	30.1	36.32	42.18	30.2	39.36	45.67	30.2	56.88	50.13
31.0	14.25	34.75	31.0	34.67	33.38	31.0	36.22	41.84	31.2	39.15	45.45	31.2	56.63	50.01
	13.74	+13.71		51.04	+51.03		11.90	−11.86		12.33	+12.29		11.86	+11.82
0^{h} 57^{m} 24^{s}.633			1^{h} 31^{m} 11^{s}.709			1^{h} 41^{m} 54^{s}.846			4^{h} 10^{m} 37^{s}.831			5^{h} 35^{m} 50^{s}.330		
+85° 49′ 24″.14			+88° 52′ 20″.55			−85° 10′ 45″.22			+85° 20′ 28″.88			+85° 9′ 34″.51		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	5 45	−84 50	Mar.	6 46	−80 44	Mar.	7 3	+87 10	Mar.	7 14	+82 34	Mar.	7 15	−86 54
	s	″		s	″		s	″		s	″		s	″
0.3	49.91	5.08	0.3	50.79	7.74	0.4	31.86	52.93	0.4	20.31	24.65	0.4	46.06	40.41
1.3	49.64	5.13	1.3	50.65	7.90	1.4	31.50	53.15	1.4	20.18	24.90	1.4	45.67	40.59
2.3	49.37	5.22	2.3	50.52	8.05	2.3	31.13	53.36	2.4	20.04	25.11	2.4	45.29	40.78
3.3	49.13	5.30	3.3	50.39	8.23	3.3	30.73	53.55	3.4	19.89	25.31	3.4	44.93	41.00
4.3	48.86	5.39	4.3	50.26	8.41	4.3	30.32	53.71	4.4	19.75	25.49	4.4	44.56	41.23
5.3	48.59	5.49	5.3	50.12	8.61	5.3	29.93	53.85	5.3	19.60	25.64	5.4	44.19	41.46
6.3	48.31	5.60	6.3	49.99	8.82	6.3	29.55	53.96	6.3	19.46	25.76	6.3	43.79	41.71
7.3	48.02	5.70	7.3	49.85	9.02	7.3	29.21	54.07	7.3	19.34	25.89	7.3	43.38	41.96
8.3	47.71	5.77	8.3	49.70	9.21	8.3	28.88	54.20	8.3	19.23	26.00	8.3	42.93	42.21
9.3	47.40	5.82	9.3	49.54	9.36	9.3	28.56	54.34	9.3	19.12	26.15	9.3	42.47	42.41
10.3	47.10	5.84	10.3	49.39	9.49	10.3	28.24	54.49	10.3	19.01	26.33	10.3	42.01	42.59
11.3	46.81	5.83	11.3	49.23	9.60	11.3	27.92	54.64	11.3	18.88	26.50	11.3	41.55	42.74
12.3	46.52	5.82	12.3	49.08	9.71	12.3	27.55	54.82	12.3	18.75	26.67	12.3	41.10	42.89
13.3	46.24	5.81	13.3	48.93	9.80	13.3	27.17	54.99	13.3	18.62	26.85	13.3	40.67	43.02
14.3	45.97	5.80	14.3	48.79	9.88	14.3	26.75	55.14	14.3	18.47	27.03	14.3	40.25	43.15
15.3	45.71	5.81	15.3	48.64	9.98	15.3	26.29	55.29	15.3	18.29	27.18	15.3	39.84	43.28
16.3	45.45	5.82	16.3	48.50	10.08	16.3	25.84	55.40	16.3	18.13	27.30	16.3	39.44	43.43
17.3	45.18	5.83	17.3	48.36	10.19	17.3	25.39	55.49	17.3	17.95	27.40	17.3	39.04	43.61
18.3	44.91	5.85	18.3	48.22	10.32	18.3	24.94	55.58	18.3	17.78	27.50	18.3	38.64	43.76
19.2	44.64	5.87	19.3	48.08	10.43	19.3	24.50	55.64	19.3	17.63	27.58	19.3	38.23	43.92
20.2	44.35	5.89	20.3	47.93	10.55	20.3	24.07	55.70	20.3	17.47	27.64	20.3	37.81	44.08
21.2	44.07	5.91	21.3	47.78	10.68	21.3	23.66	55.75	21.3	17.32	27.71	21.3	37.35	44.26
22.2	43.78	5.93	22.3	47.63	10.78	22.3	23.27	55.80	22.3	17.17	27.77	22.3	36.90	44.41
23.2	43.49	5.91	23.3	47.48	10.87	23.3	22.88	55.85	23.3	17.03	27.85	23.3	36.43	44.55
24.2	43.19	5.87	24.3	47.30	10.93	24.3	22.50	55.92	24.3	16.90	27.93	24.3	35.95	44.67
25.2	42.90	5.82	25.3	47.15	10.99	25.3	22.12	55.99	25.3	16.76	28.02	25.3	35.46	44.77
26.2	42.61	5.74	26.3	46.99	11.03	26.3	21.74	56.07	26.3	16.62	28.11	26.3	34.98	44.86
27.2	42.32	5.65	27.3	46.84	11.04	27.3	21.34	56.15	27.3	16.48	28.21	27.3	34.50	44.93
28.2	42.05	5.57	28.3	46.67	11.06	28.3	20.92	56.22	28.3	16.31	28.30	28.3	34.04	44.99
29.2	41.79	5.49	29.3	46.53	11.07	29.3	20.46	56.28	29.3	16.14	28.39	29.3	33.60	45.04
30.2	41.53	5.42	30.3	46.39	11.11	30.3	19.99	56.33	30.3	15.97	28.44	30.3	33.17	45.12
31.2	41.27	5.37	31.3	46.24	11.14	31.3	19.51	56.33	31.3	15.79	28.48	31.3	32.74	45.21
11.11 −11.06			6.21 −6.13			20.34 +20.32			7.74 +7.67			18.56 −18.54		
5^h 45^m $51^s.396$			6^h 46^m $48^s.653$			7^h 3^m $2^s.335$			7^h 14^m $7^s.912$			7^h 15^m $39^s.691$		
−84° 49′ 44″.27			−80° 43′ 46″.14			+87° 10′ 43″.86			+82° 34′ 17″.32			−86° 54′ 19″.75		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamaeleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	8 18	+88 52	Mar.	9 8	−85 20	Mar.	9 25	+81 41	Mar.	9 36	−80 34	Mar.	10 21	+82 58
	s	″		s	″		s	″		s	″		s	″
0.4	65.97	39.99	0.4	53.82	43.42	0.5	51.08	4.67	0.5	26.64	54.81	0.5	32.71	7.20
1.4	65.38	40.29	1.4	53.67	43.74	1.5	51.05	4.99	1.5	26.58	55.15	1.5	32.72	7.54
2.4	64.71	40.58	2.4	53.52	44.06	2.4	51.00	5.31	2.5	26.52	55.48	2.5	32.71	7.89
3.4	63.98	40.86	3.4	53.39	44.37	3.4	50.95	5.63	3.5	26.47	55.82	3.5	32.67	8.23
4.4	63.20	41.11	4.4	53.26	44.71	4.4	50.88	5.92	4.4	26.43	56.19	4.5	32.64	8.55
5.4	62.41	41.34	5.4	53.14	45.07	5.4	50.81	6.20	5.4	26.39	56.56	5.5	32.59	8.84
6.4	61.65	41.54	6.4	53.01	45.44	6.4	50.75	6.44	6.4	26.34	56.93	6.5	32.55	9.13
7.4	60.94	41.73	7.4	52.86	45.81	7.4	50.69	6.68	7.4	26.29	57.34	7.5	32.52	9.41
8.4	60.29	41.92	8.4	52.70	46.18	8.4	50.64	6.92	8.4	26.24	57.74	8.5	32.50	9.68
9.4	59.68	42.12	9.4	52.51	46.55	9.4	50.59	7.16	9.4	26.18	58.12	9.5	32.49	9.94
10.4	59.07	42.35	10.4	52.32	46.89	10.4	50.55	7.43	10.4	26.09	58.49	10.5	32.47	10.21
11.4	58.45	42.59	11.4	52.11	47.22	11.4	50.52	7.71	11.4	26.02	58.84	11.5	32.47	10.50
12.4	57.77	42.83	12.4	51.90	47.51	12.4	50.47	8.00	12.4	25.93	59.18	12.5	32.44	10.82
13.4	57.01	43.10	13.4	51.70	47.78	13.4	50.41	8.30	13.4	25.85	59.50	13.5	32.40	11.15
14.4	56.19	43.35	14.4	51.51	48.06	14.4	50.33	8.59	14.4	25.76	59.79	14.5	32.36	11.48
15.4	55.29	43.59	15.4	51.33	48.35	15.4	50.25	8.90	15.4	25.69	60.08	15.5	32.30	11.82
16.4	54.33	43.79	16.4	51.15	48.64	16.4	50.15	9.19	16.4	25.61	60.39	16.4	32.24	12.14
17.4	53.35	43.99	17.4	50.98	48.93	17.4	50.05	9.47	17.4	25.55	60.70	17.4	32.15	12.46
18.4	52.37	44.17	18.4	50.81	49.24	18.4	49.95	9.71	18.4	25.48	61.03	18.4	32.07	12.75
19.4	51.39	44.33	19.4	50.63	49.55	19.4	49.85	9.95	19.4	25.41	61.37	19.4	31.99	13.04
20.4	50.43	44.48	20.4	50.45	49.86	20.4	49.75	10.18	20.4	25.34	61.70	20.4	31.90	13.32
21.4	49.49	44.63	21.4	50.26	50.17	21.4	49.65	10.41	21.4	25.26	62.03	21.4	31.82	13.58
22.3	48.60	44.78	22.4	50.05	50.49	22.4	49.56	10.61	22.4	25.18	62.37	22.4	31.74	13.84
23.3	47.74	44.94	23.4	49.83	50.78	23.4	49.48	10.81	23.4	25.09	62.71	23.4	31.68	14.09
24.3	46.90	45.11	24.4	49.60	51.08	24.4	49.39	11.02	24.4	24.99	63.03	24.4	31.61	14.35
25.3	46.06	45.27	25.4	49.36	51.36	25.4	49.31	11.25	25.4	24.89	63.33	25.4	31.55	14.62
26.3	45.22	45.42	26.4	49.11	51.60	26.4	49.23	11.49	26.4	24.79	63.62	26.4	31.49	14.88
27.3	44.34	45.60	27.4	48.86	51.84	27.4	49.15	11.72	27.4	24.69	63.91	27.4	31.41	15.17
28.3	43.41	45.75	28.4	48.62	52.07	28.4	49.06	11.96	28.4	24.58	64.16	28.4	31.33	15.45
29.3	42.40	45.90	29.4	48.39	52.30	29.4	48.95	12.21	29.4	24.48	64.41	29.4	31.24	15.74
30.3	41.32	46.05	30.4	48.17	52.53	30.4	48.82	12.45	30.4	24.38	64.67	30.4	31.14	16.04
31.3	40.20	46.19	31.4	47.95	52.76	31.4	48.70	12.66	31.4	24.29	64.94	31.4	31.01	16.32
	51.10	+51.09		12.33	−12.29		6.91	+6.84		6.11	−6.03		8.17	+8.11
$8^h\ 17^m\ 47^s.546$			$9^h\ 8^m\ 41^s.594$			$9^h\ 25^m\ 39^s.275$			$9^h\ 36^m\ 19^s.026$			$10^h\ 21^m\ 19^s.949$		
+88° 52′ 37″.80			−85° 20′ 26″.78			+81° 41′ 10″.13			−80° 34′ 39″.26			+82° 58′ 17″.67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			**Bradley 1672.** Mag. 6.3			**ι Octantis.** Mag. 5.4			**32 H. Camelop.** *seq.* Mag. 5.3			**κ Octantis.** Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	11 0	−84 9	Mar.	12 14	+88 8	Mar.	12 46	−84 41	Mar.	12 48	+83 50	Mar.	13 27	−85 22
	s	″		s	″		s	″		s	″		s	″
0.5	8.53	38.27	0.6	58.82	37.80	0.6	35.51	1.14	0.6	39.61	50.58	0.6	51.02	15.31
1.5	8.52	38.64	1.6	59.17	38.11	1.6	35.61	1.48	1.6	39.74	50.86	1.6	51.19	15.62
2.5	8.52	39.00	2.6	59.48	38.43	2.6	35.74	1.81	2.6	39.85	51.14	2.6	51.37	15.92
3.5	8.52	39.36	3.6	59.72	38.76	3.6	35.86	2.14	3.6	39.96	51.45	3.6	51.56	16.21
4.5	8.53	39.72	4.6	59.92	39.09	4.6	35.99	2.46	4.6	40.06	51.75	4.6	51.75	16.49
5.5	8.55	40.12	5.6	60.07	39.40	5.6	36.13	2.80	5.6	40.12	52.04	5.6	51.97	16.78
6.5	8.57	40.53	6.6	60.21	39.69	6.6	36.28	3.16	6.6	40.20	52.32	6.6	52.20	17.10
7.5	8.59	40.95	7.6	60.34	39.97	7.6	36.44	3.53	7.6	40.28	52.59	7.6	52.42	17.43
8.5	8.59	41.39	8.5	60.50	40.24	8.6	36.58	3.92	8.6	40.36	52.84	8.6	52.62	17.79
9.5	8.58	41.82	9.5	60.68	40.50	9.6	36.69	4.33	9.6	40.45	53.08	9.6	52.82	18.16
10.5	8.54	42.25	10.5	60.89	40.77	10.6	36.80	4.74	10.6	40.54	53.33	10.6	53.00	18.52
11.5	8.50	42.64	11.5	61.12	41.06	11.6	36.89	5.13	11.6	40.64	53.60	11.6	53.14	18.89
12.5	8.44	43.03	12.5	61.35	41.37	12.6	36.95	5.52	12.6	40.74	53.87	12.6	53.29	19.26
13.5	8.38	43.39	13.5	61.56	41.69	13.6	37.02	5.89	13.6	40.83	54.18	13.6	53.41	19.60
14.5	8.34	43.75	14.5	61.73	42.02	14.6	37.08	6.23	14.6	40.92	54.50	14.6	53.54	19.93
15.5	8.29	44.09	15.5	61.87	42.36	15.6	37.16	6.58	15.6	40.99	54.83	15.6	53.66	20.24
16.5	8.25	44.44	16.5	61.96	42.73	16.5	37.24	6.91	16.6	41.05	55.16	16.6	53.80	20.56
17.5	8.22	44.80	17.5	62.00	43.07	17.5	37.32	7.25	17.5	41.10	55.50	17.6	53.94	20.87
18.5	8.19	45.16	18.5	62.02	43.42	18.5	37.41	7.60	18.5	41.13	55.84	18.6	54.09	21.20
19.5	8.16	45.54	19.5	62.02	43.75	19.5	37.50	7.96	19.5	41.16	56.17	19.6	54.25	21.53
20.5	8.13	45.92	20.5	61.99	44.08	20.5	37.59	8.32	20.5	41.19	56.49	20.6	54.40	21.87
21.5	8.09	46.32	21.5	61.96	44.39	21.5	37.69	8.70	21.5	41.22	56.79	21.6	54.56	22.23
22.5	8.04	46.73	22.5	61.95	44.68	22.5	37.78	9.11	22.5	41.25	57.08	22.6	54.71	22.60
23.5	7.99	47.13	23.5	61.95	44.98	23.5	37.84	9.51	23.5	41.28	57.37	23.6	54.86	22.98
24.5	7.92	47.51	24.5	61.95	45.27	24.5	37.90	9.92	24.5	41.32	57.67	24.6	54.97	23.37
25.5	7.83	47.89	25.5	61.98	45.57	25.5	37.94	10.32	25.5	41.35	57.96	25.6	55.08	23.76
26.4	7.74	48.26	26.5	62.02	45.88	26.5	37.98	10.71	26.5	41.40	58.24	26.6	55.17	24.15
27.4	7.65	48.61	27.5	62.06	46.19	27.5	37.98	11.10	27.5	41.44	58.56	27.5	55.26	24.53
28.4	7.55	48.95	28.5	62.07	46.52	28.5	38.00	11.47	28.5	41.47	58.89	28.5	55.32	24.89
29.4	7.46	49.28	29.5	62.04	46.86	29.5	38.02	11.84	29.5	41.48	59.23	29.5	55.40	25.24
30.4	7.37	49.61	30.5	61.97	47.20	30.5	38.03	12.17	30.5	41.50	59.57	30.5	55.48	25.58
31.4	7.31	49.94	31.5	61.84	47.54	31.5	38.07	12.51	31.5	41.50	59.92	31.5	55.57	25.91
	9.83	−9.78		30.89	+30.88		10.80	−10.75		9.33	+9.28		12.39	−12.35
10^h	59^m	$54^s.546$	12^h	14^m	$29^s.190$	12^h	46^m	$19^s.119$	12^h	48^m	$31^s.308$	13^h	27^m	$32^s.891$
−84°	9′	29″.33	+88°	8′	56″.19	−84°	41′	1″.57	+83°	51′	11″.30	−85°	22′	19″.48

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	14 13	−83 17	Mar.	15 3	+87 32	Mar.	15 24	−84 11	Mar.	16 54	+82 10	Mar.	17 16	−80 46
	s	″		s	″		s	″		s	″		s	″
0.7	58.56	46.76	0.7	0.96	19.73	0.7	34.92	42.25	0.8	8.59	1.51	0.8	21.59	56.22
1.7	58.71	47.03	1.7	1.47	19.85	1.7	35.13	42.42	1.8	8.77	1.45	1.8	21.75	56.21
2.6	58.86	47.27	2.7	1.98	19.98	2.7	35.35	42.57	2.8	8.94	1.42	2.8	21.89	56.20
3.6	59.03	47.49	3.7	2.46	20.15	3.7	35.57	42.72	3.8	9.11	1.42	3.8	22.04	56.17
4.6	59.20	47.72	4.7	2.90	20.33	4.7	35.80	42.85	4.8	9.28	1.45	4.8	22.21	56.13
5.6	59.38	47.97	5.7	3.31	20.52	5.7	36.05	42.98	5.8	9.43	1.48	5.8	22.38	56.10
6.6	59.56	48.23	6.7	3.69	20.70	6.7	36.32	43.13	6.7	9.58	1.52	6.8	22.56	56.05
7.6	59.76	48.51	7.7	4.06	20.88	7.7	36.58	43.30	7.7	9.73	1.56	7.8	22.75	56.03
8.6	59.95	48.81	8.7	4.43	21.02	8.7	36.84	43.49	8.7	9.88	1.57	8.8	22.93	56.02
9.6	60.13	49.13	9.7	4.82	21.16	9.7	37.09	43.72	9.7	10.03	1.58	9.8	23.12	56.05
10.6	60.29	49.46	10.7	5.23	21.29	10.7	37.34	43.96	10.7	10.18	1.57	10.8	23.31	56.08
11.6	60.43	49.80	11.7	5.65	21.43	11.7	37.57	44.20	11.7	10.33	1.56	11.7	23.49	56.14
12.6	60.56	50.13	12.7	6.11	21.59	12.7	37.78	44.44	12.7	10.51	1.56	12.7	23.65	56.21
13.6	60.69	50.43	13.7	6.57	21.77	13.7	37.98	44.67	13.7	10.68	1.56	13.7	23.80	56.28
14.6	60.82	50.72	14.6	7.02	21.96	14.7	38.17	44.88	14.7	10.85	1.61	14.7	23.95	56.32
15.6	60.95	51.01	15.6	7.45	22.18	15.7	38.36	45.07	15.7	11.02	1.67	15.7	24.10	56.37
16.6	61.07	51.28	16.6	7.87	22.42	16.7	38.55	45.27	16.7	11.19	1.76	16.7	24.24	56.40
17.6	61.20	51.55	17.6	8.25	22.66	17.7	38.75	45.45	17.7	11.34	1.86	17.7	24.39	56.42
18.6	61.34	51.82	18.6	8.62	22.91	18.7	38.97	45.65	18.7	11.50	1.99	18.7	24.55	56.43
19.6	61.49	52.11	19.6	8.95	23.15	19.7	39.20	45.85	19.7	11.66	2.11	19.7	24.72	56.46
20.6	61.64	52.42	20.6	9.28	23.40	20.6	39.42	46.06	20.7	11.81	2.23	20.7	24.89	56.49
21.6	61.78	52.73	21.6	9.59	23.65	21.6	39.64	46.29	21.7	11.97	2.36	21.7	25.06	56.53
22.6	61.93	53.05	22.6	9.90	23.88	22.6	39.87	46.52	22.7	12.11	2.46	22.7	25.23	56.60
23.6	62.07	53.39	23.6	10.21	24.11	23.6	40.09	46.78	23.7	12.25	2.56	23.7	25.41	56.68
24.6	62.20	53.74	24.6	10.52	24.31	24.6	40.31	47.05	24.7	12.39	2.66	24.7	25.59	56.78
25.6	62.33	54.10	25.6	10.84	24.52	25.6	40.51	47.34	25.7	12.53	2.75	25.7	25.76	56.90
26.6	62.43	54.46	26.6	11.18	24.74	26.6	40.70	47.63	26.7	12.68	2.85	26.7	25.93	57.03
27.6	62.53	54.80	27.6	11.53	24.98	27.6	40.88	47.91	27.7	12.84	2.95	27.7	26.08	57.16
28.6	62.62	55.14	28.6	11.88	25.22	28.6	41.05	48.19	28.7	12.99	3.07	28.7	26.23	57.29
29.6	62.71	55.45	29.6	12.22	25.48	29.6	41.21	48.46	29.7	13.15	3.20	29.7	26.38	57.39
30.6	62.80	55.76	30.6	12.54	25.76	30.6	41.38	48.71	30.7	13.30	3.37	30.7	26.52	57.49
31.6	62.90	56.06	31.6	12.82	26.08	31.6	41.55	48.95	31.7	13.45	3.55	31.7	26.66	57.58
	8.57	−8.51		23.29	+23.27		9.89	−9.84		7.34	+7.27		6.24	−6.16
14^h	13^m	$46^s.350$	15^h	3^m	$2^s.510$	15^h	24^m	$23^s.351$	16^h	54^m	$12^s.991$	17^h	16^m	$17^s.234$
−83°	17′	54″.52	+87°	32′	42″.66	−84°	11′	55″.43	+82°	10′	21″.42	−80°	47′	14″.27

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. **Mag. 4.4**			**χ Octantis.** **Mag. 5.2**			**λ Ursæ Minoris.** **Mag. 6.6**			**σ Octantis.** **Mag. 5.5**			**76 Draconis.** **Mag. 5.7**		
Wash. Mean Time.	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	17 58	+86 36	Mar.	18 7	−87 39	Mar.	18 58	+89 0	Mar.	19 30	−89 12	Mar.	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
0.8	4.66	35.70	0.8	28.81	30.66	0.9	57.30	62.75	0.9	27.79	53.37	0.9	22.55	56.34
1.8	5.03	35.55	1.8	29.37	30.57	1.8	58.36	62.53	1.9	29.23	53.17	1.9	22.64	56.01
2.8	5.41	35.44	2.8	29.94	30.47	2.8	59.50	62.33	2.9	30.60	52.94	2.9	22.72	55.69
3.8	5.78	35.34	3.8	30.50	30.34	3.8	60.67	62.15	3.9	31.96	52.71	3.9	22.81	55.40
4.8	6.16	35.27	4.8	31.08	30.22	4.8	61.84	62.01	4.9	33.34	52.46	4.9	22.92	55.13
5.8	6.52	35.21	5.8	31.68	30.08	5.8	62.97	61.88	5.9	34.77	52.20	5.9	23.03	54.89
6.8	6.86	35.18	6.8	32.32	29.95	6.8	64.05	61.77	6.9	36.32	51.95	6.9	23.13	54.66
7.8	7.19	35.15	7.8	33.00	29.85	7.8	65.07	61.66	7.9	37.98	51.70	7.9	23.22	54.45
8.8	7.50	35.09	8.8	33.70	29.75	8.8	66.04	61.53	8.9	39.75	51.45	8.9	23.31	54.22
9.8	7.82	35.02	9.8	34.41	29.68	9.8	67.01	61.40	9.8	41.57	51.24	9.9	23.40	53.99
10.8	8.14	34.94	10.8	35.11	29.63	10.8	67.97	61.25	10.8	43.40	51.04	10.9	23.49	53.75
11.8	8.48	34.85	11.8	35.77	29.59	11.8	68.99	61.07	11.8	45.19	50.86	11.9	23.57	53.48
12.8	8.85	34.76	12.8	36.41	29.56	12.8	70.10	60.91	12.8	46.90	50.71	12.9	23.66	53.21
13.8	9.23	34.70	13.8	37.02	29.54	13.8	71.28	60.76	13.8	48.55	50.55	13.9	23.76	52.93
14.8	9.62	34.64	14.8	37.59	29.51	14.8	72.53	60.61	14.8	50.12	50.40	14.9	23.87	52.66
15.8	10.02	34.60	15.8	38.16	29.47	15.8	73.83	60.49	15.8	51.64	50.22	15.9	24.00	52.39
16.8	10.43	34.59	16.8	38.74	29.42	16.8	75.15	60.38	16.8	53.14	50.04	16.9	24.12	52.15
17.8	10.81	34.60	17.8	39.32	29.36	17.8	76.47	60.30	17.8	54.66	49.85	17.9	24.25	51.91
18.8	11.20	34.62	18.8	39.91	29.31	18.8	77.77	60.24	18.8	56.21	49.67	18.9	24.38	51.70
19.8	11.57	34.65	19.8	40.53	29.25	19.8	79.04	60.18	19.8	57.83	49.49	19.9	24.52	51.51
20.8	11.94	34.68	20.8	41.18	29.19	20.8	80.26	60.13	20.8	59.51	49.30	20.9	24.65	51.33
21.8	12.28	34.72	21.8	41.84	29.14	21.8	81.45	60.09	21.8	61.26	49.12	21.9	24.78	51.15
22.7	12.63	34.75	22.8	42.52	29.12	22.8	82.62	60.04	22.8	63.07	48.95	22.9	24.91	50.98
23.7	12.97	34.78	23.8	43.21	29.11	23.8	83.74	59.99	23.8	64.94	48.80	23.9	25.04	50.80
24.7	13.30	34.79	24.8	43.89	29.11	24.8	84.85	59.94	24.8	66.86	48.65	24.9	25.16	50.62
25.7	13.65	34.79	25.7	44.56	29.13	25.8	85.97	59.87	25.8	68.78	48.53	25.9	25.27	50.43
26.7	14.01	34.80	26.7	45.23	29.17	26.8	87.12	59.79	26.8	70.68	48.43	26.9	25.39	50.23
27.7	14.37	34.81	27.7	45.85	29.22	27.8	88.33	59.72	27.8	72.51	48.34	27.9	25.52	50.03
28.7	14.74	34.85	28.7	46.47	29.27	28.8	89.59	59.66	28.8	74.26	48.25	28.9	25.65	49.83
29.7	15.12	34.90	29.7	47.04	29.32	29.8	90.91	59.61	29.8	75.96	48.15	29.8	25.79	49.64
30.7	15.52	34.98	30.7	47.61	29.34	30.8	92.27	59.60	30.8	77.59	48.04	30.8	25.94	49.46
31.7	15.90	35.07	31.7	48.20	29.35	31.8	93.64	59.60	31.8	79.21	47.92	31.8	26.09	49.32
	16.91	+16.88		24.47	−24.45		58.28	+58.27		72.89	−72.89		7.40	+7.33
$17^{h}\ 58^{m}\ 22^{s}.311$			$18^{h}\ 7^{m}\ 23^{s}.343$			$19^{h}\ 0^{m}\ 15^{s}.079$			$19^{h}\ 30^{m}\ 50^{s}.769$			$20^{h}\ 48^{m}\ 32^{s}.146$		
+86° 36′ 51″.04			−87° 39′ 50″.89			+89° 1′ 12″.80			−89° 13′ 13″.35			+82° 13′ 56″.82		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	21 38	−83 5	Mar.	22 16	−86 22	Mar.	22 37	−81 48	Mar.	23 27	+86 51	Mar.	23 47	−82 27
	s	″		s	″		s	″		s	″		s	″
0.9	31.84	20.89	0.9	16.76	39.60	1.0	44.72	15.75	1.0	24.29	53.03	1.1	14.89	65.09
1.9	31.93	20.56	1.9	16.85	39.26	2.0	44.75	15.39	2.0	24.19	52.68	2.0	14.86	64.73
2.9	31.99	20.23	2.9	16.91	38.91	2.9	44.76	15.05	3.0	24.12	52.33	3.0	14.81	64.40
3.9	32.05	19.89	3.9	16.97	38.56	3.9	44.77	14.69	4.0	24.08	51.98	4.0	14.77	64.05
4.9	32.11	19.53	4.9	17.03	38.19	4.9	44.78	14.34	5.0	24.07	51.65	5.0	14.72	63.69
5.9	32.19	19.16	5.9	17.08	37.79	5.9	44.79	13.95	6.0	24.07	51.33	6.0	14.67	63.31
6.9	32.26	18.77	6.9	17.15	37.38	6.9	44.80	13.54	7.0	24.08	51.04	7.0	14.63	62.91
7.9	32.35	18.38	7.9	17.25	36.96	7.9	44.84	13.13	8.0	24.08	50.76	8.0	14.59	62.50
8.9	32.46	18.00	8.9	17.39	36.54	8.9	44.88	12.69	9.0	24.07	50.49	9.0	14.58	62.08
9.9	32.59	17.62	9.9	17.54	36.16	9.9	44.94	12.28	10.0	24.03	50.21	10.0	14.57	61.65
10.9	32.72	17.25	10.9	17.71	35.78	10.9	45.00	11.90	11.0	23.99	49.92	11.0	14.58	61.23
11.9	32.85	16.92	11.9	17.89	35.41	11.9	45.07	11.52	12.0	23.94	49.60	12.0	14.59	60.85
12.9	32.98	16.60	12.9	18.06	35.05	12.9	45.13	11.15	13.0	23.89	49.27	13.0	14.60	60.46
13.9	33.09	16.30	13.9	18.23	34.72	13.9	45.19	10.81	14.0	23.87	48.94	14.0	14.60	60.10
14.9	33.20	16.01	14.9	18.37	34.39	14.9	45.24	10.48	14.9	23.87	48.57	15.0	14.61	59.74
15.9	33.30	15.72	15.9	18.50	34.07	15.9	45.29	10.15	15.9	23.90	48.21	16.0	14.61	59.41
16.9	33.39	15.41	16.9	18.63	33.74	16.9	45.33	9.81	16.9	23.94	47.86	17.0	14.60	59.05
17.9	33.48	15.09	17.9	18.75	33.40	17.9	45.37	9.45	17.9	24.01	47.52	18.0	14.58	58.69
18.9	33.58	14.77	18.9	18.87	33.04	18.9	45.41	9.09	18.9	24.10	47.19	19.0	14.57	58.32
19.9	33.68	14.44	19.9	19.01	32.68	19.9	45.45	8.72	19.9	24.20	46.87	19.9	14.56	57.96
20.9	33.81	14.10	20.9	19.16	32.32	20.9	45.51	8.35	20.9	24.31	46.57	20.9	14.56	57.58
21.9	33.93	13.76	21.9	19.33	31.95	21.9	45.56	7.97	21.9	24.41	46.28	21.9	14.56	57.16
22.9	34.06	13.41	22.9	19.51	31.57	22.9	45.64	7.59	22.9	24.50	45.99	22.9	14.57	56.75
23.9	34.20	13.08	23.9	19.70	31.19	23.9	45.72	7.20	23.9	24.60	45.69	23.9	14.61	56.34
24.9	34.36	12.76	24.9	19.93	30.82	24.9	45.80	6.82	24.9	24.67	45.40	24.9	14.64	55.92
25.9	34.53	12.45	25.9	20.17	30.47	25.9	45.90	6.45	25.9	24.73	45.11	25.9	14.68	55.52
26.9	34.67	12.16	26.9	20.42	30.13	26.9	45.99	6.11	26.9	24.80	44.80	26.9	14.73	55.12
27.9	34.83	11.87	27.9	20.66	29.82	27.9	46.09	5.78	27.9	24.88	44.48	27.9	14.78	54.75
28.9	34.97	11.60	28.9	20.89	29.52	28.9	46.18	5.45	28.9	24.96	44.17	28.9	14.82	54.39
29.9	35.11	11.34	29.9	21.09	29.23	29.9	46.27	5.13	29.9	25.08	43.84	29.9	14.85	54.04
30.9	35.24	11.07	30.9	21.29	28.93	30.9	46.34	4.81	30.9	25.22	43.52	30.9	14.87	53.70
31.9	35.37	10.79	31.9	21.47	28.61	31.9	46.41	4.49	31.9	25.41	43.20	31.9	14.90	53.35
	8.31	−8.25		15.82	−15.79		7.01	−6.94		18.28	+18.25		7.63	−7.56
21^h	38^m	$38^s.548$	22^h	16^m	$33^s.212$	22^h	37^m	$51^s.624$	23^h	27^m	$43^s.571$	23^h	47^m	$23^s.637$
−83°	5′	34″.33	−86°	22′	50″.92	−81°	48′	24″.80	+86°	51′	38″.62	−82°	28′	8″.42

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	0 57	+85 49	Apr.	1 30	+88 52	Apr.	1 41	−85 10	Apr.	4 10	+85 20	Apr.	5 35	+85 9
	s	″		s	″		s	″		s	″		s	″
0.0	14.25	34.75	0.0	34.67	33.38	0.0	36.22	41.84	0.2	39.15	45.45	0.2	56.63	50.01
1.0	14.27	34.41	1.0	34.55	33.04	1.0	36.12	41.50	1.1	38.94	45.22	1.2	56.38	49.87
2.0	14.31	34.07	2.0	34.53	32.70	2.0	36.00	41.16	2.1	38.76	44.97	2.2	56.15	49.72
3.0	14.37	33.74	3.0	34.57	32.38	3.0	35.87	40.79	3.1	38.61	44.72	3.2	55.94	49.57
4.0	14.43	33.45	4.0	34.62	32.09	4.0	35.77	40.41	4.1	38.46	44.48	4.2	55.74	49.41
5.0	14.49	33.18	5.0	34.65	31.81	5.0	35.67	40.01	5.1	38.32	44.26	5.2	55.56	49.27
6.0	14.54	32.91	6.0	34.64	31.53	6.0	35.60	39.60	6.1	38.19	44.07	6.2	55.37	49.16
6.9	14.56	32.64	7.0	34.57	31.26	7.0	35.54	39.20	7.1	38.05	43.87	7.2	55.19	49.05
7.9	14.58	32.37	8.0	34.46	30.98	8.0	35.48	38.79	8.1	37.88	43.68	8.2	54.98	48.94
8.9	14.58	32.07	9.0	34.33	30.66	9.0	35.44	38.39	9.1	37.70	43.48	9.2	54.76	48.83
9.9	14.59	31.75	10.0	34.21	30.33	10.0	35.43	38.01	10.1	37.51	43.26	10.2	54.53	48.71
10.9	14.62	31.42	11.0	34.14	30.00	11.0	35.40	37.66	11.1	37.32	43.01	11.2	54.29	48.57
11.9	14.66	31.08	12.0	34.12	29.65	12.0	35.36	37.32	12.1	37.14	42.75	12.2	54.05	48.40
12.9	14.72	30.74	13.0	34.16	29.28	13.0	35.32	36.98	13.1	36.96	42.48	13.2	53.81	48.23
13.9	14.81	30.40	14.0	34.29	28.93	14.0	35.27	36.65	14.1	36.80	42.20	14.2	53.58	48.04
14.9	14.90	30.07	14.9	34.46	28.59	15.0	35.22	36.31	15.1	36.65	41.92	15.2	53.36	47.83
15.9	15.00	29.75	15.9	34.69	28.26	16.0	35.16	35.96	16.1	36.52	41.63	16.2	53.16	47.61
16.9	15.13	29.44	16.9	34.96	27.94	17.0	35.11	35.59	17.1	36.41	41.34	17.2	52.98	47.39
17.9	15.26	29.14	17.9	35.24	27.65	17.9	35.06	35.21	18.1	36.30	41.05	18.2	52.80	47.18
18.9	15.36	28.86	18.9	35.52	27.35	18.9	35.03	34.83	19.1	36.21	40.77	19.2	52.63	46.98
19.9	15.47	28.60	19.9	35.79	27.06	19.9	35.00	34.43	20.1	36.11	40.53	20.2	52.48	46.79
20.9	15.58	28.34	20.9	36.03	26.78	20.9	34.99	34.04	21.1	36.02	40.27	21.2	52.32	46.60
21.9	15.69	28.08	21.9	36.26	26.50	21.9	34.99	33.65	22.1	35.92	40.03	22.2	52.16	46.41
22.9	15.79	27.80	22.9	36.45	26.22	22.9	35.01	33.25	23.1	35.82	39.79	23.1	51.99	46.24
23.9	15.89	27.53	23.9	36.63	25.92	23.9	35.05	32.86	24.1	35.70	39.53	24.1	51.81	46.05
24.9	15.98	27.25	24.9	36.83	25.61	24.9	35.08	32.48	25.1	35.57	39.26	25.1	51.62	45.86
25.9	16.09	26.96	25.9	37.08	25.29	25.9	35.11	32.11	26.1	35.46	38.97	26.1	51.44	45.65
26.9	16.22	26.65	26.9	37.38	24.97	26.9	35.12	31.78	27.1	35.35	38.66	27.1	51.25	45.42
27.9	16.36	26.34	27.9	37.79	24.65	27.9	35.12	31.46	28.1	35.25	38.35	28.1	51.07	45.16
28.9	16.54	26.05	28.9	38.29	24.33	28.9	35.12	31.12	29.1	35.18	38.01	29.1	50.91	44.88
29.9	16.74	25.78	29.9	38.85	24.04	29.9	35.12	30.76	30.1	35.12	37.67	30.1	50.77	44.59
30.9	16.95	25.54	30.9	39.45	23.75	30.9	35.12	30.40	31.1	35.11	37.35	31.1	50.65	44.31
	13.74	+13.70		50.91	+50.90		11.89	−11.85		12.32	+12.28		11.86	+11.82
$0^{h}\ 57^{m}\ 24^{s}.633$			$1^{h}\ 31^{m}\ 11^{s}.709$			$1^{h}\ 41^{m}\ 54^{s}.846$			$4^{h}\ 10^{m}\ 37^{s}.831$			$5^{h}\ 35^{m}\ 50^{s}.330$		
+85° 49′ 24″.14			+88° 52′ 20″.55			−85° 10′ 45″.22			+85° 20′ 28″.88			+85° 9′ 34″.51		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			**ζ Mensæ.** Mag. 5.6			**51 H. Cephei.** Mag. 5.3			**25 H. Camelop.** Mag. 5.1			**7 G. Octantis.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	5 45	−84 50	Apr.	6 46	−80 44	Apr.	7 3	+87 10	Apr.	7 14	+82 34	Apr.	7 15	−86 54
	s	″		s	″		s	″		s	″		s	″
0.2	41.27	5.37	0.3	46.24	11.14	0.3	19.51	56.33	0.3	15.79	28.48	0.3	32.74	45.21
1.2	41.01	5.33	1.3	46.09	11.19	1.3	19.05	56.33	1.3	15.61	28.48	1.3	32.31	45.31
2.2	40.74	5.30	2.3	45.95	11.25	2.3	18.60	56.30	2.3	15.45	28.47	2.3	31.88	45.43
3.2	40.46	5.27	3.3	45.80	11.32	3.3	18.18	56.26	3.3	15.30	28.43	3.3	31.42	45.54
4.2	40.17	5.21	4.2	45.63	11.38	4.3	17.80	56.21	4.3	15.15	28.40	4.3	30.94	45.64
5.2	39.87	5.13	5.2	45.46	11.40	5.3	17.42	56.16	5.3	15.01	28.39	5.3	30.44	45.74
6.2	39.58	5.03	6.2	45.31	11.41	6.3	17.06	56.15	6.3	14.90	28.38	6.3	29.93	45.80
7.2	39.29	4.90	7.2	45.15	11.39	7.3	16.69	56.14	7.3	14.76	28.38	7.3	29.42	45.84
8.2	39.02	4.76	8.2	44.99	11.35	8.2	16.32	56.14	8.3	14.61	28.41	8.3	28.94	45.84
9.2	38.77	4.60	9.2	44.84	11.29	9.2	15.90	56.15	9.3	14.46	28.44	9.3	28.46	45.83
10.2	38.52	4.46	10.2	44.69	11.24	10.2	15.47	56.15	10.3	14.30	28.45	10.3	28.01	45.84
11.2	38.27	4.33	11.2	44.55	11.19	11.2	15.01	56.14	11.2	14.12	28.45	11.2	27.58	45.84
12.2	38.03	4.21	12.2	44.41	11.14	12.2	14.54	56.10	12.2	13.95	28.44	12.2	27.15	45.83
13.2	37.80	4.09	13.2	44.27	11.12	13.2	14.06	56.04	13.2	13.77	28.40	13.2	26.73	45.84
14.2	37.56	3.96	14.2	44.13	11.09	14.2	13.60	55.96	14.2	13.58	28.35	14.2	26.31	45.88
15.2	37.32	3.86	15.2	43.98	11.08	15.2	13.15	55.87	15.2	13.41	28.27	15.2	25.89	45.91
16.2	37.07	3.75	16.2	43.84	11.05	16.2	12.72	55.76	16.2	13.25	28.18	16.2	25.46	45.95
17.2	36.82	3.62	17.2	43.69	11.02	17.2	12.30	55.65	17.2	13.10	28.09	17.2	25.00	45.98
18.2	36.55	3.50	18.2	43.55	10.98	18.2	11.91	55.54	18.2	12.95	27.99	18.2	24.55	46.00
19.2	36.30	3.37	19.2	43.40	10.94	19.2	11.53	55.43	19.2	12.81	27.90	19.2	24.08	46.01
20.2	36.05	3.19	20.2	43.25	10.87	20.2	11.17	55.32	20.2	12.67	27.81	20.2	23.60	46.00
21.2	35.79	3.01	21.2	43.09	10.78	21.2	10.81	55.22	21.2	12.54	27.72	21.2	23.12	45.97
22.2	35.54	2.82	22.2	42.95	10.69	22.2	10.46	55.13	22.2	12.41	27.67	22.2	22.64	45.92
23.2	35.29	2.61	23.2	42.80	10.58	23.2	10.10	55.05	23.2	12.27	27.62	23.2	22.16	45.86
24.2	35.07	2.40	24.2	42.66	10.45	24.2	9.72	54.96	24.2	12.13	27.55	24.2	21.71	45.77
25.1	34.84	2.19	25.2	42.52	10.32	25.2	9.32	54.88	25.2	11.99	27.47	25.2	21.28	45.69
26.1	34.64	1.99	26.2	42.38	10.20	26.2	8.90	54.76	26.2	11.82	27.39	26.2	20.85	45.63
27.1	34.44	1.80	27.2	42.25	10.10	27.2	8.47	54.63	27.2	11.65	27.27	27.2	20.45	45.57
28.1	34.21	1.64	28.2	42.12	10.01	28.2	8.04	54.47	28.2	11.50	27.13	28.2	20.04	45.54
29.1	34.00	1.49	29.2	41.99	9.93	29.2	7.65	54.29	29.2	11.34	26.96	29.2	19.64	45.51
30.1	33.78	1.33	30.2	41.86	9.86	30.2	7.28	54.10	30.2	11.20	26.78	30.2	19.22	45.49
31.1	33.54	1.16	31.2	41.72	9.77	31.2	6.95	53.89	31.2	11.08	26.59	31.2	18.77	45.46
	11.11	−11.06		6.21	−6.13		20.34	+20.32		7.74	+7.67		18.57	−18.54
$5^h\ 45^m\ 51^s.396$			$6^h\ 46^m\ 48^s.653$			$7^h\ 3^m\ 2^s.335$			$7^h\ 14^m\ 7^s.912$			$7^h\ 15^m\ 39^s.691$		
−84° 49′ 44″.27			−80° 43′ 46″.14			+87° 10′ 43″.86			+82° 34′ 17″.32			−86° 54′ 19″.75		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	8 18	+88 52	Apr.	9 8	−85 20	Apr.	9 25	+81 41	Apr.	9 36	−80 35	Apr.	10 21	+82 58
	s	″		s	″		s	″		s	″		s	″
0.3	40.20	46.19	0.4	47.95	52.76	0.4	48.70	12.66	0.4	24.29	4.94	0.4	31.01	16.32
1.3	39.07	46.28	1.4	47.75	53.03	1.4	48.57	12.85	1.4	24.20	5.22	1.4	30.88	16.56
2.3	37.97	46.35	2.4	47.53	53.29	2.4	48.44	13.01	2.4	24.11	5.50	2.4	30.76	16.80
3.3	36.91	46.41	3.3	47.31	53.57	3.4	48.32	13.15	3.4	24.02	5.81	3.4	30.64	17.00
4.3	35.93	46.46	4.3	47.07	53.84	4.4	48.21	13.29	4.4	23.93	6.11	4.4	30.53	17.20
5.3	35.00	46.52	5.3	46.82	54.11	5.4	48.10	13.43	5.4	23.83	6.40	5.4	30.43	17.38
6.3	34.11	46.61	6.3	46.55	54.36	6.4	48.00	13.58	6.4	23.70	6.69	6.4	30.34	17.58
7.3	33.22	46.70	7.3	46.28	54.58	7.4	47.91	13.75	7.4	23.58	6.94	7.4	30.25	17.80
8.3	32.29	46.79	8.3	46.00	54.77	8.3	47.81	13.93	8.4	23.46	7.17	8.4	30.15	18.02
9.3	31.30	46.88	9.3	45.72	54.95	9.3	47.70	14.11	9.4	23.34	7.39	9.4	30.05	18.26
10.3	30.24	46.98	10.3	45.46	55.13	10.3	47.58	14.29	10.3	23.22	7.59	10.4	29.94	18.50
11.3	29.12	47.08	11.3	45.21	55.30	11.3	47.44	14.47	11.3	23.11	7.77	11.4	29.81	18.75
12.3	27.96	47.15	12.3	44.96	55.48	12.3	47.31	14.66	12.3	23.00	7.96	12.4	29.67	19.00
13.3	26.78	47.20	13.3	44.73	55.65	13.3	47.16	14.81	13.3	22.89	8.17	13.4	29.52	19.24
14.3	25.57	47.23	14.3	44.49	55.83	14.3	47.01	14.95	14.3	22.79	8.39	14.4	29.37	19.44
15.3	24.39	47.24	15.3	44.26	56.02	15.3	46.87	15.06	15.3	22.68	8.62	15.4	29.21	19.64
16.3	23.23	47.25	16.3	44.01	56.22	16.3	46.72	15.17	16.3	22.58	8.84	16.4	29.06	19.82
17.3	22.11	47.26	17.3	43.77	56.41	17.3	46.58	15.27	17.3	22.47	9.06	17.4	28.90	19.97
18.3	21.04	47.25	18.3	43.51	56.60	18.3	46.45	15.35	18.3	22.36	9.28	18.4	28.76	20.13
19.3	20.02	47.24	19.3	43.24	56.79	19.3	46.32	15.43	19.3	22.23	9.50	19.4	28.62	20.29
20.3	19.02	47.23	20.3	42.96	56.97	20.3	46.20	15.51	20.3	22.11	9.70	20.4	28.49	20.44
21.3	18.05	47.21	21.3	42.68	57.12	21.3	46.08	15.59	21.3	21.98	9.89	21.4	28.36	20.59
22.3	17.09	47.21	22.3	42.39	57.27	22.3	45.97	15.68	22.3	21.85	10.08	22.3	28.23	20.74
23.3	16.12	47.23	23.3	42.09	57.40	23.3	45.85	15.79	23.3	21.72	10.24	23.3	28.12	20.92
24.3	15.10	47.24	24.3	41.80	57.50	24.3	45.72	15.90	24.3	21.58	10.38	24.3	27.99	21.09
25.3	14.03	47.24	25.3	41.52	57.60	25.3	45.58	16.01	25.3	21.45	10.51	25.3	27.84	21.26
26.3	12.91	47.24	26.3	41.24	57.69	26.3	45.44	16.10	26.3	21.32	10.64	26.3	27.69	21.41
27.2	11.73	47.20	27.3	40.99	57.79	27.3	45.29	16.19	27.3	21.21	10.76	27.3	27.51	21.56
28.2	10.55	47.16	28.3	40.75	57.90	28.3	45.13	16.25	28.3	21.10	10.90	28.3	27.34	21.70
29.2	9.38	47.08	29.3	40.50	58.03	29.3	44.98	16.29	29.3	20.98	11.07	29.3	27.16	21.81
30.2	8.28	46.99	30.3	40.25	58.17	30.3	44.83	16.29	30.3	20.87	11.24	30.3	26.99	21.92
31.2	7.25	46.87	31.3	39.98	58.33	31.3	44.69	16.28	31.3	20.74	11.42	31.3	26.83	21.98
	51.15	+51.14		12.33	−12.29		6.92	+6.84		6.11	−6.03		8.17	+8.11
8^h	17^m	$47^s.546$	9^h	8^m	$41^s.594$	9^h	25^m	$39^s.275$	9^h	36^m	$19^s.026$	10^h	21^m	$19^s.949$
+88°	52′	37″.80	−85°	20′	26″.78	+81°	41′	10″.13	−80°	34′	39″.26	+82°	58′	17″.67

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis Mag. 6.3			**Bradley 1672.** Mag. 6.3			**ι Octantis.** Mag. 5.4			**32 H. Camelop.** *seq.* Mag. 5.3			**κ Octantis.** Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	11 0	−84 9	Apr.	12 14	+88 8	Apr.	12 46	−84 41	Apr.	12 48	+83 50	Apr.	13 27	−85 22
	s	″		s	″		s	″		s	″		s	″
0.4	7.31	49.94	0.5	61.84	47.54	0.5	38.07	12.51	0.5	41.50	59.92	0.5	55.57	25.91
1.4	7.24	50.28	1.5	61.65	47.87	1.5	38.12	12.88	1.5	41.48	60.27	1.5	55.68	26.25
2.4	7.17	50.65	2.5	61.43	48.18	2.5	38.18	13.25	2.5	41.45	60.60	2.5	55.79	26.61
3.4	7.11	51.03	3.5	61.21	48.47	3.5	38.24	13.64	3.5	41.41	60.91	3.5	55.92	26.98
4.4	7.02	51.42	4.5	61.01	48.75	4.5	38.29	14.05	4.5	41.38	61.20	4.5	56.03	27.38
5.4	6.93	51.80	5.5	60.83	49.02	5.5	38.33	14.46	5.5	41.36	61.48	5.5	56.13	27.79
6.4	6.82	52.18	6.5	60.69	49.29	6.5	38.34	14.88	6.5	41.35	61.76	6.5	56.20	28.21
7.4	6.69	52.53	7.5	60.57	49.56	7.5	38.34	15.30	7.5	41.35	62.04	7.5	56.25	28.62
8.4	6.55	52.87	8.5	60.46	49.85	8.5	38.30	15.68	8.5	41.35	62.34	8.5	56.29	29.00
9.4	6.41	53.18	9.5	60.33	50.16	9.5	38.27	16.06	9.5	41.35	62.65	9.5	56.31	29.38
10.4	6.28	53.47	10.5	60.17	50.48	10.5	38.24	16.40	10.5	41.34	62.97	10.5	56.32	29.74
11.4	6.16	53.77	11.5	59.99	50.83	11.5	38.21	16.75	11.5	41.30	63.32	11.5	56.34	30.08
12.4	6.05	54.06	12.5	59.75	51.16	12.5	38.20	17.09	12.5	41.26	63.67	12.5	56.37	30.42
13.4	5.94	54.34	13.5	59.47	51.50	13.5	38.18	17.42	13.5	41.20	64.02	13.5	56.41	30.75
14.4	5.83	54.63	14.4	59.15	51.82	14.5	38.17	17.75	14.5	41.14	64.36	14.5	56.45	31.09
15.4	5.72	54.94	15.4	58.82	52.12	15.5	38.17	18.10	15.5	41.07	64.68	15.5	56.50	31.43
16.4	5.62	55.25	16.4	58.45	52.41	16.5	38.17	18.46	16.5	40.99	65.00	16.5	56.55	31.77
17.4	5.51	55.56	17.4	58.09	52.69	17.5	38.16	18.82	17.5	40.91	65.32	17.5	56.59	32.13
18.4	5.38	55.89	18.4	57.75	52.96	18.5	38.15	19.19	18.5	40.84	65.60	18.5	56.63	32.50
19.4	5.26	56.21	19.4	57.40	53.20	19.5	38.12	19.57	19.5	40.76	65.88	19.5	56.67	32.89
20.4	5.12	56.53	20.4	57.07	53.44	20.5	38.09	19.95	20.5	40.70	66.15	20.5	56.68	33.27
21.4	4.97	56.82	21.4	56.77	53.68	21.5	38.05	20.34	21.5	40.64	66.42	21.5	56.69	33.67
22.4	4.81	57.10	22.4	56.48	53.95	22.4	37.99	20.71	22.5	40.59	66.70	22.5	56.68	34.06
23.4	4.64	57.38	23.4	56.20	54.21	23.4	37.93	21.08	23.4	40.53	66.98	23.5	56.64	34.44
24.4	4.47	57.63	24.4	55.90	54.48	24.4	37.84	21.42	24.4	40.48	67.27	24.5	56.61	34.81
25.4	4.32	57.87	25.4	55.58	54.75	25.4	37.75	21.75	25.4	40.39	67.58	25.5	56.57	35.15
26.4	4.16	58.11	26.4	55.21	55.03	26.4	37.70	22.08	26.4	40.31	67.89	26.5	56.54	35.48
27.4	4.01	58.34	27.4	54.79	55.30	27.4	37.63	22.39	27.4	40.22	68.19	27.5	56.52	35.80
28.4	3.86	58.59	28.4	54.31	55.55	28.4	37.57	22.70	28.4	40.11	68.49	28.5	56.51	36.12
29.4	3.74	58.86	29.4	53.80	55.80	29.4	37.53	23.02	29.4	39.98	68.78	29.5	56.51	36.45
30.4	3.61	59.13	30.4	53.29	56.02	30.4	37.50	23.36	30.4	39.85	69.03	30.5	56.52	36.79
31.3	3.47	59.41	31.4	52.77	56.22	31.4	37.46	23.72	31.4	39.72	69.28	31.5	56.53	37.16
9.84 −9.79			30.94 +30.92			10.80 −10.76			9.34 +9.28			12.40 −12.36		
10^{h} 59^{m} $54^{s}.546$			12^{h} 14^{m} $29^{s}.190$			12^{h} 46^{m} $19^{s}.119$			12^{h} 48^{m} $31^{s}.308$			13^{h} 27^{m} $32^{s}.891$		
−84° 9′ 29″.33			+88° 8′ 56″.19			−84° 41′ 1″.57			+83° 51′ 11″.30			−85° 22′ 19″.48		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			**Groombridge 2283.** Mag. 7.2			**ρ Octantis.** Mag. 5.7			**ε Ursæ Minoris.** Mag. 4.4			**59 G. Apodis.** Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	14 14	−83 17	Apr.	15 3	+87 32	Apr.	15 24	−84 11	Apr.	16 54	+82 10	Apr.	17 16	−80 46
	s	″		s	″		s	″		s	″		s	″
0.6	2.90	56.06	0.6	12.82	26.08	0.6	41.55	48.95	0.7	13.45	3.55	0.7	26.66	57.58
1.6	3.01	56.37	1.6	13.06	26.39	1.6	41.73	49.18	1.7	13.59	3.75	1.7	26.81	57.65
2.6	3.14	56.69	2.6	13.26	26.70	2.6	41.92	49.41	2.7	13.72	3.96	2.7	26.98	57.73
3.6	3.27	57.02	3.6	13.45	26.99	3.6	42.14	49.67	3.7	13.85	4.17	3.7	27.15	57.80
4.6	3.40	57.38	4.6	13.62	27.28	4.6	42.35	49.94	4.7	13.97	4.37	4.7	27.33	57.90
5.6	3.50	57.76	5.6	13.81	27.53	5.6	42.55	50.25	5.7	14.09	4.54	5.7	27.50	58.04
6.6	3.61	58.15	6.6	14.01	27.78	6.6	42.75	50.57	6.7	14.21	4.70	6.7	27.68	58.19
7.6	3.70	58.53	7.6	14.23	28.02	7.6	42.93	50.90	7.7	14.33	4.85	7.7	27.84	58.37
8.5	3.77	58.91	8.6	14.47	28.28	8.6	43.07	51.23	8.7	14.46	5.01	8.7	27.99	58.54
9.5	3.83	59.29	9.6	14.72	28.55	9.6	43.21	51.56	9.7	14.60	5.18	9.7	28.13	58.73
10.5	3.88	59.63	10.6	14.97	28.83	10.6	43.34	51.86	10.7	14.73	5.37	10.7	28.27	58.91
11.5	3.94	59.96	11.6	15.20	29.15	11.6	43.46	52.14	11.7	14.87	5.58	11.7	28.40	59.07
12.5	3.99	60.29	12.6	15.41	29.47	12.6	43.59	52.42	12.6	15.00	5.81	12.7	28.53	59.21
13.5	4.05	60.60	13.6	15.60	29.80	13.6	43.72	52.70	13.6	15.13	6.05	13.7	28.65	59.36
14.5	4.11	60.92	14.6	15.75	30.15	14.6	43.87	52.96	14.6	15.24	6.32	14.7	28.79	59.49
15.5	4.20	61.23	15.6	15.88	30.50	15.6	44.01	53.22	15.6	15.35	6.59	15.7	28.92	59.63
16.5	4.27	61.56	16.6	15.98	30.82	16.6	44.16	53.49	16.6	15.47	6.86	16.7	29.06	59.77
17.5	4.35	61.90	17.6	16.08	31.15	17.6	44.31	53.77	17.6	15.58	7.13	17.6	29.21	59.92
18.5	4.42	62.25	18.6	16.15	31.47	18.6	44.47	54.08	18.6	15.67	7.40	18.6	29.36	60.07
19.5	4.48	62.62	19.6	16.23	31.76	19.6	44.62	54.40	19.6	15.77	7.65	19.6	29.51	60.25
20.5	4.54	62.98	20.5	16.31	32.05	20.6	44.77	54.72	20.6	15.86	7.90	20.6	29.66	60.44
21.5	4.60	63.36	21.5	16.39	32.34	21.6	44.91	55.06	21.6	15.97	8.13	21.6	29.80	60.63
22.5	4.64	63.74	22.5	16.48	32.63	22.6	45.02	55.41	22.6	16.07	8.35	22.6	29.95	60.87
23.5	4.67	64.13	23.5	16.59	32.91	23.6	45.12	55.76	23.6	16.16	8.58	23.6	30.08	61.10
24.5	4.68	64.49	24.5	16.70	33.20	24.6	45.22	56.10	24.6	16.27	8.82	24.6	30.21	61.31
25.5	4.69	64.84	25.5	16.81	33.51	25.5	45.31	56.44	25.6	16.37	9.09	25.6	30.31	61.52
26.5	4.71	65.18	26.5	16.89	33.84	26.5	45.39	56.74	26.6	16.47	9.35	26.6	30.42	61.73
27.5	4.74	65.49	27.5	16.94	34.18	27.5	45.48	57.03	27.6	16.56	9.65	27.6	30.53	61.92
28.5	4.77	65.81	28.5	16.95	34.55	28.5	45.58	57.31	28.6	16.65	9.97	28.6	30.65	62.10
29.5	4.82	66.13	29.5	16.93	34.90	29.5	45.70	57.60	29.6	16.73	10.30	29.6	30.78	62.26
30.5	4.86	66.46	30.5	16.87	35.24	30.5	45.83	57.91	30.6	16.79	10.63	30.6	30.91	62.44
31.5	4.91	66.83	31.5	16.80	35.57	31.5	45.95	58.23	31.6	16.85	10.95	31.6	31.05	62.62
	8.57	−8.51		23.32	+23.29		9.89	−9.84		7.34	+7.27		6.24	−6.16
14^h	13^m	$46^s.350$	15^h	3^m	$2^s.510$	15^h	24^m	$23^s.351$	16^h	54^m	$12^s.991$	17^h	16^m	$17^s.234$
−83°	17′	54″.52	+87°	32′	42″.66	−84°	11′	55″.43	+82°	10′	21″.42	−80°	47′	14″.27

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	17 58	+86 36	Apr.	18 7	−87 39	Apr.	18 59	+89 0	Apr.	19 31	−89 12	Apr.	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
0.7	15.90	35.07	0.7	48.20	29.35	0.8	33.64	59.60	0.8	19.21	47.92	0.8	26.09	49.32
1.7	16.26	35.18	1.7	48.80	29.35	1.8	34.98	59.63	1.8	20.87	47.78	1.8	26.25	49.18
2.7	16.60	35.31	2.7	49.44	29.35	2.8	36.25	59.67	2.8	22.61	47.63	2.8	26.41	49.08
3.7	16.93	35.43	3.7	50.11	29.35	3.8	37.43	59.73	3.8	24.46	47.49	3.8	26.57	48.99
4.7	17.25	35.54	4.7	50.80	29.38	4.8	38.55	59.79	4.8	26.42	47.37	4.8	26.72	48.91
5.7	17.53	35.65	5.7	51.50	29.42	5.8	39.63	59.81	5.8	28.43	47.27	5.8	26.86	48.82
6.7	17.85	35.75	6.7	52.19	29.50	6.8	40.70	59.82	6.8	30.47	47.20	6.8	27.00	48.71
7.7	18.16	35.84	7.7	52.85	29.59	7.7	41.80	59.83	7.8	32.47	47.15	7.8	27.13	48.58
8.7	18.49	35.93	8.7	53.49	29.70	8.7	42.96	59.83	8.8	34.41	47.11	8.8	27.27	48.46
9.7	18.83	36.02	9.7	54.09	29.80	9.7	44.20	59.84	9.8	36.24	47.07	9.8	27.41	48.33
10.7	19.19	36.15	10.7	54.65	29.90	10.7	45.49	59.85	10.8	37.97	47.04	10.8	27.56	48.21
11.7	19.55	36.28	11.7	55.20	29.99	11.7	46.83	59.89	11.8	39.65	47.01	11.8	27.71	48.10
12.7	19.92	36.41	12.7	55.72	30.09	12.7	48.18	59.94	12.8	41.29	46.97	12.8	27.89	48.00
13.7	20.27	36.58	13.7	56.27	30.16	13.7	49.53	60.02	13.8	42.91	46.92	13.8	28.06	47.92
14.7	20.61	36.76	14.7	56.82	30.22	14.7	50.84	60.12	14.8	44.56	46.87	14.8	28.24	47.85
15.7	20.94	36.95	15.7	57.39	30.29	15.7	52.12	60.23	15.7	46.25	46.80	15.8	28.40	47.80
16.7	21.26	37.15	16.7	57.97	30.37	16.7	53.35	60.34	16.7	48.00	46.74	16.8	28.57	47.77
17.7	21.55	37.35	17.7	58.57	30.46	17.7	54.53	60.46	17.7	49.79	46.70	17.8	28.74	47.76
18.7	21.85	37.55	18.7	59.18	30.55	18.7	55.66	60.57	18.7	51.65	46.66	18.8	28.90	47.75
19.7	22.13	37.75	19.7	59.80	30.65	19.7	56.75	60.70	19.7	53.56	46.63	19.8	29.06	47.74
20.7	22.40	37.94	20.7	60.43	30.77	20.7	57.80	60.81	20.7	55.51	46.62	20.8	29.21	47.72
21.7	22.67	38.11	21.7	61.05	30.91	21.7	58.84	60.92	21.7	57.46	46.62	21.8	29.36	47.70
22.7	22.94	38.28	22.7	61.65	31.08	22.7	59.91	61.02	22.7	59.38	46.65	22.8	29.51	47.67
23.7	23.22	38.45	23.7	62.22	31.25	23.7	61.00	61.11	23.7	61.24	46.68	23.8	29.66	47.64
24.7	23.51	38.62	24.7	62.75	31.40	24.7	62.13	61.21	24.7	63.04	46.73	24.8	29.82	47.60
25.7	23.81	38.80	25.7	63.27	31.56	25.7	63.31	61.34	25.7	64.74	46.77	25.8	29.97	47.56
26.7	24.11	39.01	26.7	63.77	31.71	26.7	64.53	61.46	26.7	66.37	46.81	26.8	30.15	47.55
27.7	24.41	39.24	27.7	64.26	31.85	27.7	65.75	61.61	27.7	67.97	46.83	27.8	30.33	47.55
28.6	24.70	39.50	28.7	64.76	31.97	28.7	66.93	61.79	28.7	69.59	46.84	28.8	30.50	47.59
29.6	24.96	39.77	29.7	65.28	32.09	29.7	68.04	61.99	29.7	71.25	46.83	29.8	30.68	47.64
30.6	25.20	40.04	30.6	65.84	32.21	30.7	69.08	62.20	30.7	73.01	46.82	30.8	30.85	47.72
31.6	25.41	40.31	31.6	66.44	32.35	31.7	70.03	62.41	31.7	74.86	46.82	31.8	31.02	47.81
16.91 +16.88			24.48 −24.45			58.27 +58.26			72.81 −72.80			7.40 +7.33		
17^{h} 58^{m} $22^{s}.311$			18^{h} 7^{m} $23^{s}.343$			19^{h} 0^{m} $15^{s}.079$			19^{h} 30^{m} $50^{s}.769$			20^{h} 48^{m} $32^{s}.146$		
+86° 36′ 51″.04			−87° 39′ 50″.89			+89° 1′ 12″.80			−89° 13′ 13″.35			+82° 13′ 56″.82		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			**υ Octantis.** Mag. 5.7			**β Octantis.** Mag. 4.3			**39 H. Cephei.** Mag. 5.6			**γ¹ Octantis.** Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	21 38	−83 5	Apr.	22 16	−86 22	Apr.	22 37	−81 47	Apr.	23 27	+86 51	Apr.	23 47	−82 27
	s	″		s	″		s	″		s	″		s	″
0.9	35.37	10.79	0.9	21.47	28.61	0.9	46.41	64.49	0.9	25.41	43.20	0.9	14.90	53.35
1.9	35.50	10.48	1.9	21.65	28.27	1.9	46.48	64.16	1.9	25.60	42.92	1.9	14.92	52.98
2.9	35.63	10.18	2.9	21.84	27.91	2.9	46.55	63.79	2.9	25.83	42.65	2.9	14.94	52.61
3.9	35.77	9.86	3.9	22.06	27.55	3.9	46.63	63.40	3.9	26.03	42.39	3.9	14.97	52.21
4.9	35.95	9.53	4.9	22.30	27.20	4.9	46.73	63.02	4.9	26.23	42.15	4.9	15.01	51.80
5.9	36.12	9.22	5.9	22.56	26.86	5.9	46.83	62.65	5.9	26.42	41.91	5.9	15.07	51.37
6.9	36.30	8.94	6.9	22.85	26.52	6.9	46.96	62.31	6.9	26.57	41.67	6.9	15.15	50.95
7.9	36.49	8.67	7.9	23.15	26.21	7.9	47.09	61.97	7.9	26.72	41.42	7.9	15.22	50.57
8.9	36.67	8.44	8.9	23.45	25.93	8.9	47.21	61.66	8.9	26.87	41.15	8.9	15.30	50.19
9.9	36.84	8.21	9.9	23.74	25.66	9.9	47.31	61.37	9.9	27.04	40.87	9.9	15.38	49.83
10.8	37.02	8.01	10.9	24.01	25.40	10.9	47.42	61.09	10.9	27.22	40.57	10.9	15.45	49.49
11.8	37.16	7.81	11.9	24.25	25.14	11.9	47.53	60.81	11.9	27.42	40.27	11.9	15.51	49.18
12.8	37.31	7.59	12.9	24.50	24.89	12.9	47.63	60.52	12.9	27.65	39.98	12.9	15.57	48.86
13.8	37.46	7.37	13.9	24.73	24.63	13.9	47.72	60.24	13.9	27.91	39.70	13.9	15.63	48.55
14.8	37.60	7.13	14.9	24.96	24.36	14.9	47.81	59.96	14.9	28.19	39.42	14.9	15.68	48.21
15.8	37.75	6.89	15.9	25.20	24.09	15.9	47.90	59.65	15.9	28.47	39.17	15.9	15.73	47.87
16.8	37.92	6.64	16.9	25.46	23.82	16.9	48.01	59.35	16.9	28.75	38.93	16.9	15.78	47.50
17.8	38.09	6.40	17.9	25.72	23.54	17.9	48.12	59.03	17.9	29.03	38.70	17.9	15.86	47.15
18.8	38.25	6.16	18.9	26.00	23.25	18.9	48.23	58.72	18.9	29.32	38.50	18.9	15.93	46.78
19.8	38.44	5.92	19.9	26.31	22.97	19.9	48.36	58.40	19.9	29.60	38.30	19.9	16.03	46.40
20.8	38.63	5.70	20.8	26.62	22.71	20.9	48.50	58.11	20.9	29.85	38.10	20.9	16.12	46.02
21.8	38.83	5.49	21.8	26.95	22.44	21.9	48.63	57.82	21.9	30.10	37.87	21.9	16.22	45.66
22.8	39.04	5.29	22.8	27.29	22.17	22.9	48.77	57.54	22.9	30.34	37.66	22.9	16.33	45.32
23.8	39.24	5.10	23.8	27.62	21.94	23.9	48.92	57.27	23.9	30.58	37.44	23.9	16.44	44.99
24.8	39.43	4.93	24.8	27.95	21.74	24.9	49.06	57.04	24.9	30.84	37.22	24.9	16.54	44.67
25.8	39.61	4.79	25.8	28.27	21.53	25.8	49.20	56.81	25.9	31.11	36.98	25.9	16.64	44.37
26.8	39.78	4.64	26.8	28.56	21.33	26.8	49.32	56.58	26.9	31.41	36.75	26.9	16.74	44.08
27.8	39.95	4.48	27.8	28.83	21.13	27.8	49.42	56.35	27.9	31.73	36.54	27.9	16.83	43.79
28.8	40.11	4.30	28.8	29.11	20.91	28.8	49.54	56.10	28.9	32.09	36.35	28.9	16.91	43.48
29.8	40.27	4.11	29.8	29.39	20.69	29.8	49.66	55.83	29.9	32.47	36.18	29.9	16.99	43.16
30.8	40.45	3.90	30.8	29.68	20.43	30.8	49.78	55.56	30.9	32.84	36.02	30.9	17.07	42.82
31.8	40.64	3.69	31.8	30.00	20.18	31.8	49.92	55.28	31.9	33.19	35.88	31.9	17.17	42.46
	8.31	−8.24		15.81	−15.78		7.01	−6.94		18.26	+18.23		7.62	−7.56
$21^h\ 38^m\ 38^s.548$			$22^h\ 16^m\ 33^s.212$			$22^h\ 37^m\ 51^s.624$			$23^h\ 27^m\ 43^s.571$			$23^h\ 47^m\ 23^s.637$		
−83° 5′ 34″.33			−86° 22′ 50″.92			−81° 48′ 24″.80			+86° 51′ 38″.62			−82° 28′ 8″.42		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	0 57	+85 49	May	1 30	+88 52	May	1 41	−85 10	May	4 10	+85 20	May	5 35	+85 9
	s	″		s	″		s	″		s	″		s	″
0.9	16.95	25.54	0.9	39.45	23.75	0.9	35.12	30.40	1.1	35.11	37.35	1.1	50.65	44.31
1.9	17.16	25.30	1.9	40.05	23.48	1.9	35.12	30.01	2.1	35.10	37.06	2.1	50.55	44.04
2.9	17.35	25.10	2.9	40.63	23.24	2.9	35.13	29.60	3.1	35.08	36.77	3.1	50.45	43.80
3.9	17.54	24.90	3.9	41.14	23.00	3.9	35.17	29.20	4.1	35.05	36.50	4.1	50.36	43.57
4.9	17.70	24.69	4.9	41.60	22.76	4.9	35.22	28.80	5.1	35.01	36.24	5.1	50.26	43.36
5.9	17.85	24.47	5.9	42.02	22.52	5.9	35.31	28.40	6.1	34.96	35.98	6.1	50.14	43.14
6.9	18.00	24.23	6.9	42.42	22.25	6.9	35.39	28.03	7.1	34.90	35.72	7.1	50.01	42.91
7.9	18.15	23.98	7.9	42.85	21.99	7.9	35.47	27.68	8.0	34.83	35.44	8.1	49.86	42.67
8.9	18.32	23.73	8.9	43.33	21.71	8.9	35.55	27.35	9.0	34.76	35.12	9.1	49.72	42.41
9.9	18.50	23.46	9.9	43.88	21.41	9.9	35.61	27.03	10.0	34.71	34.80	10.1	49.57	42.14
10.9	18.72	23.20	10.9	44.50	21.12	10.9	35.67	26.72	11.0	34.69	34.46	11.1	49.44	41.86
11.9	18.94	22.95	11.9	45.18	20.83	11.9	35.73	26.41	12.0	34.68	34.11	12.1	49.33	41.54
12.9	19.17	22.70	12.9	45.91	20.56	12.9	35.78	26.09	13.0	34.68	33.77	13.1	49.22	41.22
13.9	19.41	22.47	13.9	46.67	20.32	13.9	35.84	25.76	14.0	34.69	33.45	14.1	49.12	40.92
14.9	19.66	22.27	14.9	47.45	20.08	14.9	35.90	25.43	15.0	34.70	33.12	15.1	49.06	40.62
15.9	19.91	22.08	15.9	48.23	19.84	15.9	35.97	25.07	16.0	34.74	32.82	16.1	49.00	40.33
16.9	20.16	21.91	16.9	49.00	19.62	16.9	36.06	24.71	17.0	34.78	32.53	17.1	48.95	40.03
17.9	20.40	21.75	17.9	49.76	19.42	17.9	36.15	24.35	18.0	34.82	32.24	18.1	48.90	39.76
18.9	20.63	21.59	18.9	50.47	19.21	18.9	36.26	24.00	19.0	34.85	31.95	19.1	48.85	39.49
19.9	20.85	21.44	19.9	51.15	19.01	19.9	36.37	23.65	20.0	34.89	31.69	20.1	48.80	39.22
20.9	21.05	21.26	20.9	51.81	18.81	20.9	36.50	23.31	21.0	34.90	31.43	21.1	48.74	38.98
21.9	21.25	21.09	21.9	52.47	18.58	21.9	36.64	22.98	22.0	34.91	31.15	22.1	48.66	38.71
22.9	21.48	20.91	22.9	53.16	18.36	22.9	36.78	22.66	23.0	34.94	30.84	23.1	48.58	38.43
23.9	21.71	20.72	23.9	53.89	18.13	23.9	36.92	22.37	24.0	34.97	30.53	24.1	48.52	38.13
24.9	21.97	20.53	24.9	54.70	17.89	24.9	37.03	22.08	25.0	34.99	30.22	25.1	48.45	37.81
25.9	22.24	20.35	25.9	55.61	17.66	25.9	37.13	21.81	25.9	35.03	29.88	26.1	48.39	37.48
26.9	22.53	20.19	26.9	56.58	17.45	26.9	37.23	21.53	26.9	35.10	29.53	27.1	48.35	37.13
27.9	22.85	20.05	27.9	57.61	17.25	27.9	37.32	21.24	27.9	35.20	29.19	28.1	48.35	36.79
28.9	23.16	19.94	28.9	58.65	17.09	28.9	37.43	20.92	28.9	35.33	28.90	29.0	48.37	36.47
29.9	23.45	19.84	29.9	59.66	16.95	29.9	37.55	20.59	29.9	35.45	28.61	30.0	48.40	36.15
30.9	23.74	19.76	30.9	60.61	16.81	30.9	37.68	20.25	30.9	35.57	28.34	31.0	48.43	35.87
31.8	24.01	19.69	31.9	61.50	16.68	31.9	37.83	19.90	31.9	35.68	28.09	32.0	48.46	35.58
	13.73	+13.69		50.81	+50.80		11.89	−11.84		12.32	+12.28		11.86	+11.81
	$0^h\ 57^m\ 24^s.633$			$1^h\ 31^m\ 11^s.709$			$1^h\ 41^m\ 54^s.846$			$4^h\ 10^m\ 37^s.831$			$5^h\ 35^m\ 50^s.330$	
		+85° 49′ 24″.14			+88° 52′ 20″.55			−85° 10′ 45″.22			+85° 20′ 28″.88			+85° 9′ 34″.51

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	5 45	−84 49	May	6 46	−80 44	May	7 2	+87 10	May	7 14	+82 34	May	7 15	−86 54
	s	″		s	″		s	″		s	″		s	″
1.1	33.54	61.16	1.2	41.72	9.77	1.2	66.95	53.89	1.2	11.08	26.59	1.2	18.77	45.46
2.1	33.29	60.98	2.2	41.58	9.67	2.2	66.65	53.70	2.2	10.97	26.43	2.2	18.31	45.41
3.1	33.05	60.75	3.2	41.44	9.54	3.2	66.36	53.52	3.2	10.87	26.29	3.2	17.83	45.35
4.1	32.82	60.52	4.2	41.30	9.40	4.2	66.08	53.37	4.2	10.77	26.13	4.2	17.36	45.26
5.1	32.62	60.28	5.2	41.16	9.23	5.2	65.80	53.22	5.2	10.66	25.99	5.2	16.90	45.16
6.1	32.41	60.01	6.2	41.02	9.04	6.2	65.48	53.07	6.2	10.53	25.87	6.2	16.46	45.02
7.1	32.22	59.75	7.2	40.89	8.84	7.2	65.15	52.92	7.2	10.41	25.75	7.2	16.05	44.88
8.1	32.05	59.50	8.2	40.76	8.66	8.2	64.78	52.75	8.2	10.27	25.62	8.2	15.65	44.73
9.1	31.87	59.25	9.2	40.66	8.48	9.2	64.42	52.58	9.2	10.13	25.47	9.2	15.27	44.60
10.1	31.70	59.01	10.1	40.54	8.32	10.2	64.04	52.39	10.2	9.99	25.29	10.2	14.91	44.47
11.1	31.53	58.79	11.1	40.43	8.16	11.2	63.67	52.16	11.2	9.84	25.11	11.2	14.55	44.37
12.1	31.36	58.58	12.1	40.32	8.01	12.2	63.33	51.94	12.2	9.70	24.89	12.2	14.19	44.26
13.1	31.19	58.36	13.1	40.21	7.86	13.2	62.99	51.71	13.2	9.58	24.67	13.2	13.82	44.15
14.1	31.01	58.14	14.1	40.09	7.71	14.2	62.70	51.46	14.2	9.45	24.44	14.2	13.44	44.05
15.1	30.83	57.92	15.1	39.98	7.56	15.1	62.41	51.20	15.2	9.35	24.21	15.2	13.05	43.95
16.1	30.65	57.69	16.1	39.85	7.38	16.1	62.16	50.94	16.2	9.26	23.97	16.2	12.66	43.82
17.1	30.47	57.45	17.1	39.73	7.20	17.1	61.91	50.71	17.1	9.16	23.74	17.2	12.25	43.69
18.1	30.29	57.17	18.1	39.62	6.99	18.1	61.68	50.49	18.1	9.08	23.55	18.1	11.84	43.51
19.1	30.12	56.88	19.1	39.51	6.77	19.1	61.46	50.26	19.1	9.00	23.34	19.1	11.45	43.34
20.1	29.95	56.58	20.1	39.39	6.55	20.1	61.24	50.03	20.1	8.91	23.15	20.1	11.06	43.16
21.1	29.80	56.28	21.1	39.28	6.30	21.1	61.00	49.81	21.1	8.82	22.96	21.1	10.67	42.97
22.1	29.66	55.98	22.1	39.18	6.05	22.1	60.73	49.60	22.1	8.73	22.77	22.1	10.32	42.77
23.1	29.54	55.68	23.1	39.07	5.80	23.1	60.46	49.38	23.1	8.63	22.57	23.1	9.99	42.56
24.1	29.42	55.39	24.1	38.98	5.57	24.1	60.19	49.15	24.1	8.52	22.34	24.1	9.67	42.37
25.1	29.30	55.11	25.1	38.89	5.37	25.1	59.92	48.89	25.1	8.40	22.09	25.1	9.35	42.20
26.1	29.17	54.86	26.1	38.80	5.16	26.1	59.66	48.61	26.1	8.29	21.82	26.1	9.04	42.05
27.1	29.04	54.63	27.1	38.70	4.96	27.1	59.43	48.30	27.1	8.20	21.53	27.1	8.73	41.90
28.1	28.90	54.39	28.1	38.61	4.78	28.1	59.24	47.98	28.1	8.13	21.23	28.1	8.39	41.75
29.1	28.76	54.12	29.1	38.52	4.59	29.1	59.08	47.67	29.1	8.08	20.94	29.1	8.03	41.60
30.1	28.61	53.84	30.1	38.42	4.36	30.1	58.95	47.38	30.1	8.03	20.66	30.1	7.67	41.42
31.0	28.46	53.52	31.1	38.31	4.10	31.1	58.84	47.10	31.1	7.99	20.40	31.1	7.30	41.23
32.0	28.33	53.19	32.1	38.21	3.83	32.1	58.73	46.83	32.1	7.95	20.16	32.1	6.94	41.00
	11.10	−11.06		6.21	−6.13		20.33	+20.31		7.74	+7.67		18.56	−18.54
	5h 45m 51s.396			6h 46m 48s.653			7h 3m 2s.335			7h 14m 7s.912			7h 15m 39s.691	
		−84° 49′ 44″.27			−80° 48′ 46″.14			+87° 10′ 48″.86			+82° 34′ 17″.32			−86° 54′ 19″.75

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	8 17	+88 52	May	9 8	−85 20	May	9 25	+81 41	May	9 36	−80 35	May	10 21	+82 58
	s	″		s	″		s	″		s	″		s	″
1.2	67.25	46.87	1.3	39.98	58.33	1.3	44.69	16.28	1.3	20.74	11.42	1.3	26.83	21.98
2.2	66.30	46.76	2.3	39.71	58.47	2.3	44.56	16.27	2.3	20.62	11.59	2.3	26.68	22.02
3.2	65.40	46.66	3.3	39.41	58.59	3.3	44.46	16.26	3.3	20.50	11.74	3.3	26.54	22.08
4.2	64.53	46.57	4.3	39.10	58.68	4.3	44.33	16.26	4.3	20.36	11.88	4.3	26.41	22.16
5.2	63.65	46.51	5.3	38.79	58.75	5.3	44.21	16.28	5.3	20.21	12.00	5.3	26.28	22.24
6.2	62.72	46.45	6.3	38.48	58.81	6.3	44.09	16.31	6.3	20.08	12.09	6.3	26.14	22.34
7.2	61.75	46.38	7.3	38.19	58.85	7.3	43.96	16.35	7.3	19.94	12.15	7.3	25.99	22.44
8.2	60.72	46.29	8.3	37.92	58.88	8.3	43.83	16.39	8.3	19.80	12.22	8.3	25.83	22.55
9.2	59.64	46.20	9.3	37.64	58.90	9.3	43.68	16.40	9.3	19.67	12.27	9.3	25.66	22.64
10.2	58.52	46.10	10.2	37.39	58.93	10.3	43.52	16.41	10.3	19.54	12.33	10.3	25.48	22.73
11.2	57.41	45.97	11.2	37.14	58.96	11.3	43.37	16.41	11.3	19.43	12.39	11.3	25.30	22.80
12.2	56.33	45.84	12.2	36.89	59.02	12.3	43.21	16.39	12.3	19.32	12.45	12.3	25.11	22.86
13.2	55.25	45.70	13.2	36.65	59.07	13.3	43.06	16.35	13.3	19.19	12.54	13.3	24.93	22.90
14.2	54.24	45.53	14.2	36.38	59.11	14.2	42.91	16.29	14.3	19.07	12.63	14.3	24.75	22.93
15.2	53.29	45.35	15.2	36.12	59.16	15.2	42.77	16.22	15.3	18.95	12.71	15.3	24.57	22.94
16.2	52.37	45.17	16.2	35.84	59.21	16.2	42.64	16.14	16.3	18.83	12.77	16.3	24.42	22.95
17.2	51.51	45.01	17.2	35.56	59.26	17.2	42.52	16.06	17.2	18.70	12.84	17.3	24.27	22.94
18.2	50.69	44.84	18.2	35.28	59.27	18.2	42.40	16.00	18.2	18.56	12.90	18.3	24.12	22.92
19.2	49.89	44.69	19.2	34.99	59.27	19.2	42.27	15.93	19.2	18.42	12.95	19.3	23.97	22.92
20.2	49.11	44.54	20.2	34.68	59.26	20.2	42.17	15.87	20.2	18.28	12.96	20.3	23.83	22.93
21.2	48.29	44.40	21.2	34.39	59.23	21.2	42.04	15.81	21.2	18.15	12.97	21.3	23.68	22.94
22.2	47.42	44.26	22.2	34.11	59.19	22.2	41.92	15.76	22.2	18.01	12.97	22.3	23.53	22.95
23.2	46.52	44.11	23.2	33.83	59.14	23.2	41.79	15.71	23.2	17.87	12.95	23.3	23.36	22.97
24.2	45.58	43.94	24.2	33.58	59.09	24.2	41.66	15.65	24.2	17.74	12.93	24.3	23.19	22.98
25.2	44.61	43.75	25.2	33.34	59.05	25.2	41.51	15.56	25.2	17.64	12.92	25.3	23.01	22.99
26.2	43.65	43.52	26.2	33.10	59.04	26.2	41.36	15.44	26.2	17.52	12.93	26.3	22.81	22.95
27.2	42.77	43.29	27.2	32.87	59.03	27.2	41.22	15.31	27.2	17.41	12.94	27.3	22.63	22.91
28.2	41.96	43.04	28.2	32.62	59.03	28.2	41.08	15.14	28.2	17.30	12.98	28.3	22.46	22.83
29.2	41.23	42.78	29.2	32.35	59.04	29.2	40.98	14.97	29.2	17.17	13.02	29.2	22.31	22.73
30.2	40.57	42.53	30.2	32.08	59.03	30.2	40.88	14.82	30.2	17.05	13.03	30.2	22.16	22.62
31.2	39.98	42.29	31.2	31.80	58.99	31.2	40.78	14.66	31.2	16.91	13.03	31.2	22.02	22.53
32.2	39.39	42.06	32.2	31.50	58.93	32.2	40.68	14.52	32.2	16.78	12.99	32.2	21.90	22.44
	51.13	+51.12		12.33	−12.29		6.92	+6.84		6.11	−6.03		8.17	+8.11
	$8^h\ 17^m\ 47^s.546$			$9^h\ 8^m\ 41^s.594$			$9^h\ 25^m\ 39^s.275$			$9^h\ 36^m\ 19^s.026$			$10^h\ 21^m\ 19^s.949$	
		+88° 52′ 37″.80			−85° 20′ 26″.78			+81° 41′ 10″.13			−80° 34′ 39″.26			+82° 58′ 17″.67

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	10 59	−84 9	May	12 14	+88 8	May	12 46	−84 41	May	12 48	+83 51	May	13 27	−85 22
	s	″		s	″		s	″		s	″		s	″
1.3	63.47	59.41	1.4	52.77	56.22	1.4	37.46	23.72	1.4	39.72	9.28	1.5	56.53	37.16
2.3	63.32	59.69	2.4	52.29	56.42	2.4	37.41	24.09	2.4	39.62	9.50	2.4	56.53	37.55
3.3	63.15	59.98	3.4	51.85	56.60	3.4	37.33	24.46	3.4	39.51	9.72	3.4	56.50	37.94
4.3	62.98	60.25	4.4	51.43	56.80	4.4	37.25	24.83	4.4	39.40	9.94	4.4	56.45	38.33
5.3	62.79	60.49	5.4	51.04	57.00	5.4	37.16	25.17	5.4	39.31	10.16	5.4	56.38	38.71
6.3	62.59	60.70	6.4	50.64	57.20	6.4	37.03	25.50	6.4	39.22	10.40	6.4	56.30	39.06
7.3	62.41	60.90	7.4	50.23	57.42	7.4	36.91	25.80	7.4	39.12	10.66	7.4	56.21	39.40
8.3	62.23	61.08	8.4	49.77	57.65	8.4	36.78	26.09	8.4	39.01	10.93	8.4	56.12	39.72
9.3	62.04	61.25	9.4	49.28	57.88	9.4	36.68	26.37	9.4	38.88	11.20	9.4	56.03	40.01
10.3	61.87	61.42	10.4	48.75	58.11	10.4	36.58	26.64	10.4	38.74	11.47	10.4	55.95	40.31
11.3	61.72	61.60	11.4	48.19	58.34	11.4	36.47	26.90	11.4	38.60	11.74	11.4	55.89	40.60
12.3	61.56	61.78	12.4	47.59	58.54	12.4	36.38	27.17	12.4	38.44	11.99	12.4	55.82	40.89
13.3	61.40	61.96	13.4	47.00	58.73	13.4	36.29	27.45	13.4	38.29	12.23	13.4	55.76	41.20
14.3	61.24	62.16	14.4	46.40	58.91	14.4	36.20	27.74	14.4	38.13	12.44	14.4	55.70	41.51
15.3	61.07	62.36	15.4	45.80	59.06	15.4	36.10	28.06	15.4	37.97	12.64	15.4	55.65	41.83
16.3	60.90	62.56	16.4	45.22	59.20	16.4	36.01	28.37	16.4	37.82	12.83	16.4	55.57	42.16
17.3	60.72	62.75	17.4	44.65	59.33	17.4	35.89	28.67	17.4	37.68	13.02	17.4	55.49	42.49
18.3	60.52	62.94	18.4	44.12	59.46	18.4	35.76	28.98	18.4	37.54	13.19	18.4	55.40	42.83
19.3	60.33	63.10	19.4	43.60	59.58	19.4	35.63	29.27	19.4	37.40	13.36	19.4	55.28	43.16
20.3	60.13	63.25	20.3	43.09	59.71	20.4	35.48	29.56	20.4	37.26	13.53	20.4	55.15	43.48
21.3	59.90	63.39	21.3	42.59	59.85	21.4	35.32	29.84	21.4	37.14	13.71	21.4	55.01	43.78
22.3	59.70	63.52	22.3	42.07	60.01	22.4	35.16	30.08	22.4	37.00	13.90	22.4	54.86	44.07
23.3	59.50	63.62	23.3	41.51	60.17	23.4	35.00	30.30	23.4	36.85	14.10	23.4	54.72	44.34
24.3	59.31	63.72	24.3	40.90	60.33	24.4	34.85	30.53	24.4	36.68	14.30	24.4	54.59	44.60
25.3	59.13	63.82	25.3	40.26	60.48	25.4	34.71	30.74	25.4	36.51	14.51	25.4	54.47	44.85
26.3	58.96	63.94	26.3	39.57	60.60	26.4	34.59	30.96	26.4	36.33	14.69	26.4	54.36	45.11
27.3	58.80	64.07	27.3	38.87	60.69	27.4	34.48	31.21	27.4	36.13	14.84	27.4	54.27	45.37
28.3	58.63	64.22	28.3	38.17	60.76	28.4	34.37	31.47	28.4	35.94	14.98	28.4	54.18	45.65
29.3	58.45	64.37	29.3	37.50	60.82	29.3	34.24	31.73	29.3	35.76	15.09	29.4	54.09	45.96
30.3	58.27	64.52	30.3	36.87	60.87	30.3	34.11	32.00	30.3	35.58	15.19	30.4	53.97	46.27
31.3	58.07	64.67	31.3	36.27	60.91	31.3	33.96	32.28	31.3	35.42	15.27	31.4	53.84	46.56
32.3	57.84	64.78	32.3	35.71	60.95	32.3	33.78	32.54	32.3	35.27	15.37	32.4	53.67	46.86
	9.84	−9.79		30.97	+30.96		10.81	−10.76		9.34	+9.29		12.41	−12.37
10^h	59^m	$54^s.546$	12^h	14^m	$29^s.190$	12^h	46^m	$19^s.119$	12^h	48^m	$31^s.308$	13^h	27^m	$32^s.891$
−84°	9′	29″.33	+88°	8′	56″.19	−84°	41′	1″.57	+83°	51′	11″.30	−85°	22′	19″.48

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	14 14	−83 18	May	15 3	+87 32	May	15 24	−84 11	May	16 54	+82 10	May	17 16	−80 47
	s	″		s	″		s	″		s	″		s	″
1.5	4.91	6.83	1.5	16.80	35.57	1.5	45.95	58.23	1.6	16.85	10.95	1.6	31.05	2.62
2.5	4.96	7.21	2.5	16.73	35.86	2.5	46.08	58.57	2.6	16.91	11.24	2.6	31.20	2.84
3.5	5.00	7.58	3.5	16.67	36.14	3.5	46.19	58.93	3.6	16.96	11.52	3.6	31.35	3.08
4.5	5.01	7.95	4.5	16.63	36.42	4.5	46.29	59.30	4.6	17.02	11.78	4.6	31.47	3.35
5.5	5.02	8.34	5.5	16.61	36.69	5.5	46.37	59.67	5.6	17.09	12.04	5.6	31.60	3.61
6.5	5.01	8.71	6.5	16.60	36.97	6.5	46.43	60.02	6.6	17.16	12.30	6.6	31.70	3.89
7.5	4.97	9.05	7.5	16.60	37.28	7.5	46.49	60.36	7.6	17.23	12.57	7.6	31.80	4.17
8.5	4.96	9.38	8.5	16.59	37.60	8.5	46.53	60.68	8.6	17.30	12.88	8.6	31.89	4.40
9.5	4.94	9.70	9.5	16.56	37.94	9.5	46.57	60.99	9.6	17.37	13.19	9.6	31.98	4.65
10.5	4.92	9.98	10.5	16.48	38.30	10.5	46.61	61.29	10.6	17.43	13.52	10.6	32.07	4.87
11.5	4.91	10.28	11.5	16.39	38.65	11.5	46.65	61.58	11.6	17.49	13.86	11.6	32.15	5.09
12.5	4.90	10.57	12.5	16.29	38.99	12.5	46.71	61.87	12.6	17.54	14.23	12.6	32.24	5.31
13.5	4.90	10.89	13.5	16.15	39.33	13.5	46.78	62.18	13.6	17.58	14.57	13.6	32.34	5.53
14.4	4.89	11.20	14.5	15.98	39.66	14.5	46.84	62.49	14.6	17.62	14.92	14.6	32.44	5.75
15.4	4.89	11.52	15.5	15.81	39.97	15.5	46.91	62.80	15.6	17.65	15.26	15.6	32.55	5.97
16.4	4.89	11.85	16.5	15.65	40.26	16.5	46.97	63.13	16.6	17.68	15.59	16.6	32.66	6.22
17.4	4.88	12.20	17.5	15.47	40.55	17.5	47.03	63.47	17.6	17.71	15.92	17.6	32.77	6.48
18.4	4.85	12.54	18.5	15.30	40.82	18.5	47.08	63.84	18.5	17.72	16.22	18.6	32.87	6.76
19.4	4.82	12.91	19.5	15.14	41.11	19.5	47.11	64.20	19.5	17.75	16.51	19.6	32.97	7.05
20.4	4.78	13.25	20.5	15.00	41.37	20.5	47.12	64.54	20.5	17.78	16.81	20.6	33.06	7.34
21.4	4.73	13.58	21.5	14.86	41.64	21.5	47.13	64.89	21.5	17.81	17.10	21.6	33.14	7.65
22.4	4.66	13.91	22.5	14.72	41.93	22.5	47.14	65.23	22.5	17.84	17.41	22.6	33.20	7.93
23.4	4.60	14.19	23.5	14.57	42.24	23.5	47.13	65.54	23.5	17.87	17.73	23.6	33.26	8.21
24.4	4.54	14.47	24.5	14.39	42.55	24.5	47.13	65.83	24.5	17.88	18.07	24.5	33.32	8.47
25.4	4.49	14.73	25.5	14.18	42.87	25.5	47.13	66.12	25.5	17.90	18.44	25.5	33.39	8.72
26.4	4.45	15.00	26.4	13.93	43.19	26.5	47.14	66.42	26.5	17.91	18.81	26.5	33.45	8.96
27.4	4.42	15.28	27.4	13.65	43.49	27.5	47.18	66.71	27.5	17.91	19.18	27.5	33.54	9.18
28.4	4.39	15.58	28.4	13.33	43.78	28.5	47.21	67.02	28.5	17.90	19.55	28.5	33.63	9.44
29.4	4.36	15.89	29.4	13.01	44.03	29.5	47.25	67.35	29.5	17.89	19.88	29.5	33.71	9.70
30.4	4.33	16.23	30.4	12.71	44.27	30.5	47.27	67.69	30.5	17.87	20.20	30.5	33.81	9.97
31.4	4.29	16.58	31.4	12.42	44.50	31.5	47.28	68.03	31.5	17.85	20.49	31.5	33.90	10.28
32.4	4.22	16.91	32.4	12.17	44.73	32.4	47.28	68.40	32.5	17.83	20.78	32.5	33.97	10.61
	8.58	−8.52		23.34	+23.32		9.90	−9.85		7.34	+7.27		6.24	−6.16
14^{h} 13^{m} 46^{s}.350			15^{h} 3^{m} 2^{s}.510			15^{h} 24^{m} 23^{s}.351			16^{h} 54^{m} 12^{s}.991			17^{h} 16^{m} 17^{s}.234		
−83° 17′ 54″.52			+87° 32′ 42″.66			−84° 11′ 55″.43			+82° 10′ 21″.42			−80° 47′ 14″.27		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			**χ Octantis.** Mag. 5.2			**λ Ursæ Minoris.** Mag. 6.6			**σ Octantis.** Mag. 5.5			**76 Draconis.** Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	17 58	+86 36	May	18 8	−87 39	May	19 0	+89 1	May	19 32	−89 12	May	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
1.6	25.41	40.31	1.6	6.44	32.35	1.7	10.03	2.41	1.7	14.86	46.82	1.8	31.02	47.81
2.6	25.60	40.56	2.6	7.04	32.51	2.7	10.92	2.61	2.7	16.79	46.85	2.8	31.17	47.90
3.6	25.80	40.79	3.6	7.64	32.69	3.7	11.76	2.79	3.7	18.75	46.89	3.8	31.32	47.96
4.6	25.99	41.01	4.6	8.21	32.88	4.7	12.63	2.96	4.7	20.67	46.95	4.7	31.46	48.03
5.6	26.21	41.22	5.6	8.75	33.11	5.7	13.51	3.11	5.7	22.53	47.03	5.7	31.60	48.08
6.6	26.43	41.44	6.6	9.24	33.34	6.7	14.46	3.26	6.7	24.29	47.13	6.7	31.75	48.12
7.6	26.67	41.68	7.6	9.70	33.56	7.7	15.46	3.43	7.7	25.95	47.24	7.7	31.90	48.16
8.6	26.91	41.93	8.6	10.13	33.78	8.7	16.51	3.61	8.7	27.51	47.35	8.7	32.07	48.21
9.6	27.15	42.20	9.6	10.55	33.98	9.7	17.58	3.79	9.7	29.01	47.45	9.7	32.24	48.25
10.6	27.39	42.47	10.6	10.96	34.16	10.7	18.63	4.01	10.7	30.47	47.55	10.7	32.41	48.34
11.6	27.61	42.76	11.6	11.37	34.34	11.7	19.67	4.24	11.7	31.95	47.63	11.7	32.58	48.44
12.6	27.81	43.07	12.6	11.80	34.52	12.7	20.65	4.48	12.7	33.44	47.71	12.7	32.75	48.56
13.6	28.01	43.38	13.6	12.26	34.69	13.6	21.57	4.72	13.7	34.97	47.79	13.7	32.93	48.69
14.6	28.18	43.69	14.6	12.71	34.87	14.6	22.44	4.97	14.7	36.56	47.85	14.7	33.08	48.84
15.6	28.33	44.01	15.6	13.17	35.06	15.6	23.25	5.24	15.7	38.19	47.93	15.7	33.24	48.99
16.6	28.48	44.30	16.6	13.65	35.28	16.6	24.01	5.50	16.7	39.86	48.02	16.7	33.39	49.15
17.6	28.62	44.60	17.6	14.12	35.51	17.6	24.72	5.75	17.7	41.56	48.12	17.7	33.54	49.29
18.6	28.75	44.89	18.6	14.59	35.75	18.6	25.41	5.99	18.7	43.27	48.26	18.7	33.69	49.44
19.6	28.88	45.16	19.6	15.05	36.00	19.6	26.08	6.23	19.7	44.96	48.40	19.7	33.82	49.58
20.6	29.01	45.43	20.6	15.47	36.26	20.6	26.77	6.46	20.7	46.58	48.56	20.7	33.96	49.71
21.6	29.15	45.69	21.6	15.85	36.53	21.6	27.50	6.68	21.6	48.12	48.72	21.7	34.09	49.84
22.6	29.30	45.97	22.6	16.20	36.78	22.6	28.27	6.91	22.6	49.58	48.88	22.7	34.23	49.95
23.6	29.45	46.25	23.6	16.54	37.03	23.6	29.07	7.14	23.6	50.95	49.04	23.7	34.38	50.09
24.6	29.60	46.56	24.8	16.86	37.27	24.6	29.88	7.40	24.6	52.26	49.19	24.7	34.53	50.27
25.6	29.73	46.89	25.6	17.19	37.50	25.6	30.65	7.68	25.6	53.54	49.33	25.7	34.70	50.44
26.6	29.85	47.24	26.6	17.54	37.71	26.6	31.37	8.00	26.6	54.86	49.47	26.7	34.85	50.66
27.6	29.95	47.61	27.6	17.91	37.91	27.6	32.00	8.33	27.6	56.25	49.60	27.7	35.00	50.89
28.6	30.01	47.96	28.6	18.31	38.14	28.6	32.53	8.64	28.6	57.73	49.73	28.7	35.15	51.13
29.6	30.06	48.30	29.6	18.72	38.38	29.6	32.97	8.96	29.6	59.29	49.86	29.7	35.29	51.37
30.6	30.09	48.63	30.6	19.14	38.64	30.6	33.39	9.26	30.6	60.88	50.01	30.7	35.41	51.61
31.6	30.12	48.93	31.6	19.54	38.91	31.6	33.76	9.54	31.6	62.47	50.19	31.7	35.54	51.82
32.6	30.15	49.22	32.6	19.92	39.21	32.6	34.14	9.81	32.6	63.99	50.39	32.7	35.64	52.02
	16.92	+16.89		24.49	−24.47		58.36	+58.35		72.83	−72.83		7.40	+7.33
17^{h} 58^{m} $22^{s}.311$			18^{h} 7^{m} $23^{s}.343$			19^{h} 0^{m} $15^{s}.079$			19^{h} 30^{m} $50^{s}.769$			20^{h} 48^{m} $32^{s}.146$		
+86° 36′ 51″.04			−87° 39′ 50″.89			+89° 1′ 12″.80			−89° 13′ 13″.35			+82° 13′ 56″.82		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	21 38	−83 5	May	22 16	−86 22	May	22 37	−81 47	May	23 27	+86 51	May	23 47	−82 27
	s	″		s	″		s	″		s	″		s	″
1.8	40.64	3.69	1.8	30.00	20.18	1.8	49.92	55.28	1.9	33.19	35.88	1.9	17.17	42.46
2.8	40.84	3.50	2.8	30.33	19.94	2.8	50.07	54.99	2.9	33.53	35.75	2.9	17.30	42.10
3.8	41.07	3.31	3.8	30.70	19.71	3.8	50.23	54.71	3.9	33.85	35.62	3.9	17.42	41.76
4.8	41.29	3.16	4.8	31.08	19.50	4.8	50.39	54.47	4.9	34.13	35.49	4.9	17.55	41.43
5.8	41.49	3.03	5.8	31.45	19.31	5.8	50.55	54.24	5.9	34.44	35.36	5.9	17.69	41.12
6.8	41.70	2.93	6.8	31.83	19.15	6.8	50.71	54.04	6.9	34.74	35.21	6.9	17.82	40.84
7.8	41.90	2.83	7.8	32.17	19.00	7.8	50.86	53.87	7.9	35.05	35.04	7.9	17.95	40.57
8.8	42.08	2.73	8.8	32.50	18.87	8.8	51.00	53.70	8.8	35.38	34.87	8.9	18.08	40.32
9.8	42.27	2.65	9.8	32.82	18.74	9.8	51.14	53.53	9.8	35.73	34.70	9.9	18.21	40.08
10.8	42.44	2.55	10.8	33.13	18.60	10.8	51.28	53.36	10.8	36.10	34.55	10.9	18.31	39.83
11.8	42.61	2.45	11.8	33.43	18.45	11.8	51.40	53.17	11.8	36.49	34.40	11.9	18.41	39.60
12.8	42.78	2.35	12.8	33.73	18.31	12.8	51.53	52.99	12.8	36.90	34.28	12.9	18.52	39.34
13.8	42.95	2.24	13.8	34.03	18.15	13.8	51.66	52.80	13.8	37.31	34.17	13.8	18.64	39.07
14.8	43.14	2.12	14.8	34.35	17.98	14.8	51.80	52.61	14.8	37.71	34.07	14.8	18.76	38.80
15.8	43.34	2.01	15.8	34.68	17.82	15.8	51.94	52.41	15.8	38.10	33.99	15.8	18.88	38.53
16.8	43.53	1.89	16.8	35.04	17.67	16.8	52.12	52.21	16.8	38.48	33.91	16.8	19.02	38.25
17.7	43.74	1.79	17.8	35.40	17.52	17.8	52.28	52.03	17.8	38.85	33.86	17.8	19.15	37.97
18.7	43.96	1.70	18.8	35.78	17.38	18.8	52.44	51.86	18.8	39.21	33.81	18.8	19.30	37.71
19.7	44.18	1.64	19.8	36.17	17.25	19.8	52.62	51.69	19.8	39.55	33.75	19.8	19.46	37.44
20.7	44.39	1.58	20.8	36.56	17.15	20.8	52.79	51.55	20.8	39.89	33.67	20.8	19.62	37.21
21.7	44.60	1.55	21.8	36.94	17.07	21.8	52.96	51.43	21.8	40.23	33.59	21.8	19.78	36.99
22.7	44.79	1.55	22.8	37.31	17.01	22.8	53.11	51.33	22.8	40.60	33.51	22.8	19.93	36.80
23.7	44.98	1.54	23.8	37.64	16.94	23.8	53.26	51.23	23.8	40.96	33.42	23.8	20.08	36.61
24.7	45.15	1.50	24.8	37.97	16.86	24.8	53.41	51.13	24.8	41.37	33.36	24.8	20.21	36.42
25.7	45.33	1.47	25.8	38.29	16.78	25.8	53.54	51.01	25.8	41.79	33.30	25.8	20.34	36.23
26.7	45.50	1.43	26.8	38.59	16.69	26.8	53.68	50.88	26.8	42.24	33.25	26.8	20.47	36.03
27.7	45.68	1.35	27.7	38.90	16.59	27.8	53.82	50.74	27.8	42.68	33.24	27.8	20.60	35.81
28.7	45.87	1.28	28.7	39.24	16.49	28.8	53.98	50.60	28.8	43.11	33.26	28.8	20.74	35.58
29.7	46.07	1.22	29.7	39.61	16.38	29.8	54.15	50.44	29.8	43.54	33.28	29.8	20.88	35.35
30.7	46.30	1.16	30.7	39.99	16.28	30.8	54.33	50.30	30.8	43.93	33.30	30.8	21.05	35.12
31.7	46.52	1.14	31.7	40.39	16.19	31.8	54.51	50.17	31.8	44.29	33.33	31.8	21.22	34.90
32.7	46.74	1.14	32.7	40.78	16.13	32.7	54.69	50.08	32.8	44.65	33.36	32.8	21.40	34.71
8.30		−8.24	15.80		−15.77	7.01		−6.94	18.25		+18.23	7.62		−7.56
21^h	38^m	$38^s.548$	22^h	16^m	$33^s.212$	22^h	37^m	$51^s.624$	23^h	27^m	$43^s.571$	23^h	47^m	$23^s.637$
−83°	5′	34″.33	−86°	22′	50″.92	−81°	48′	24″.80	+86°	51′	38″.62	−82°	28′	8″.42

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (*Polaris.*) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	0 57	+85 49	June	1 31	+88 52	June	1 41	−85 10	June	4 10	+85 20	June	5 35	+85 9
	s	″		s	″		s	″		s	″		s	″
0.8	24.01	19.69	0.9	1.50	16.68	0.9	37.83	19.90	0.9	35.68	28.09	1.0	48.46	35.58
1.8	24.26	19.60	1.9	2.34	16.55	1.9	38.01	19.58	1.9	35.78	27.85	2.0	48.47	35.32
2.8	24.50	19.49	2.9	3.15	16.41	2.9	38.19	19.26	2.9	35.86	27.60	3.0	48.46	35.05
3.8	24.74	19.38	3.9	3.97	16.24	3.9	38.39	18.98	3.9	35.94	27.33	4.0	48.45	34.78
4.8	25.00	19.25	4.9	4.80	16.07	4.9	38.55	18.73	4.9	36.01	27.05	5.0	48.43	34.47
5.8	25.27	19.13	5.9	5.72	15.91	5.9	38.72	18.48	5.9	36.09	26.76	6.0	48.41	34.16
6.8	25.55	19.00	6.9	6.67	15.73	6.9	38.88	18.25	6.9	36.17	26.45	7.0	48.40	33.86
7.8	25.85	18.89	7.9	7.68	15.55	7.9	39.03	18.01	7.9	36.27	26.14	8.0	48.40	33.52
8.8	26.16	18.78	8.9	8.74	15.40	8.9	39.18	17.78	8.9	36.39	25.82	9.0	48.41	33.18
9.8	26.48	18.68	9.8	9.84	15.25	9.9	39.34	17.55	9.9	36.53	25.50	10.0	48.45	32.83
10.8	26.81	18.61	10.8	10.96	15.12	10.9	39.49	17.30	10.9	36.67	25.21	11.0	48.49	32.50
11.8	27.13	18.55	11.8	12.07	15.00	11.8	39.66	17.05	11.9	36.83	24.93	12.0	48.55	32.17
12.8	27.45	18.51	12.8	13.17	14.91	12.8	39.83	16.78	12.9	36.99	24.67	13.0	48.62	31.86
13.8	27.77	18.48	13.8	14.25	14.82	13.8	40.00	16.52	13.9	37.16	24.42	14.0	48.70	31.56
14.8	28.06	18.47	14.8	15.29	14.76	14.8	40.18	16.26	14.9	37.33	24.18	15.0	48.79	31.28
15.8	28.34	18.46	15.8	16.28	14.69	15.8	40.38	16.01	15.9	37.49	23.96	16.0	48.85	30.99
16.8	28.62	18.45	16.8	17.25	14.61	16.8	40.60	15.76	16.9	37.64	23.73	16.9	48.92	30.73
17.8	28.89	18.42	17.8	18.19	14.53	17.8	40.83	15.53	17.9	37.79	23.51	17.9	48.98	30.46
18.8	29.17	18.37	18.8	19.14	14.45	18.8	41.05	15.33	18.9	37.92	23.27	18.9	49.04	30.19
19.8	29.44	18.32	19.8	20.13	14.35	19.8	41.27	15.12	19.9	38.05	23.02	19.9	49.08	29.91
20.8	29.75	18.28	20.8	21.17	14.25	20.8	41.47	14.94	20.9	38.20	22.76	20.9	49.13	29.59
21.8	30.06	18.24	21.8	22.29	14.15	21.8	41.67	14.78	21.9	38.37	22.48	21.9	49.19	29.28
22.8	30.39	18.22	22.8	23.49	14.06	22.8	41.85	14.61	22.9	38.55	22.20	22.9	49.28	28.94
23.8	30.74	18.21	23.8	24.73	14.01	23.8	42.03	14.42	23.9	38.75	21.91	23.9	49.38	28.61
24.8	31.09	18.24	24.8	26.00	13.97	24.8	42.21	14.23	24.9	38.98	21.66	24.9	49.51	28.26
25.8	31.44	18.29	25.8	27.24	13.96	25.8	42.39	14.01	25.9	39.22	21.43	25.9	49.66	27.94
26.8	31.78	18.36	26.8	28.44	13.97	26.8	42.59	13.79	26.9	39.46	21.24	26.9	49.82	27.66
27.8	32.10	18.43	27.8	29.57	14.00	27.8	42.81	13.59	27.9	39.69	21.04	27.9	49.97	27.40
28.8	32.39	18.50	28.8	30.64	14.03	28.8	43.05	13.38	28.9	39.91	20.87	28.9	50.11	27.16
29.8	32.67	18.57	29.8	31.66	14.04	29.8	43.30	13.17	29.9	40.10	20.70	29.9	50.24	26.92
30.8	32.94	18.61	30.8	32.65	14.04	30.8	43.55	13.00	30.9	40.29	20.51	30.9	50.35	26.66
31.8	33.22	18.64	31.8	33.66	14.01	31.8	43.80	12.85	31.9	40.48	20.32	31.9	50.46	26.39
	13.72	+13.69		50.74	+50.73		11.88	−11.84		12.31	+12.27		11.85	+11.81
0^h 57^m $24^s.633$			1^h 31^m $11^s.709$			1^h 41^m $54^s.846$			4^h 10^m $37^s.831$			5^h 35^m $50^s.330$		
+85° 49′ 24″.14			+88° 52′ 20″.55			−85° 10′ 45″.22			+85° 20′ 28″.88			+85° 9′ 34″.51		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	5 45	−84 49	June	6 46	−80 43	June	7 2	+87 10	June	7 14	+82 34	June	7 15	−86 54
	s	″		s	″		s	″		s	″		s	″
1.0	28.33	53.19	1.1	38.21	63.83	1.1	58.73	46.83	1.1	7.95	20.16	1.1	6.94	41.00
2.0	28.22	52.85	2.1	38.12	63.55	2.1	58.60	46.59	2.1	7.91	19.93	2.1	6.60	40.76
3.0	28.12	52.51	3.1	38.04	63.26	3.1	58.44	46.34	3.1	7.85	19.71	3.1	6.30	40.50
4.0	28.04	52.17	4.1	37.96	62.97	4.1	58.27	46.09	4.1	7.77	19.48	4.1	6.01	40.25
5.0	27.96	51.86	5.1	37.90	62.68	5.1	58.09	45.82	5.1	7.69	19.23	5.1	5.74	40.00
6.0	27.90	51.56	6.1	37.83	62.39	6.1	57.89	45.54	6.1	7.62	18.97	6.1	5.49	39.76
7.0	27.83	51.27	7.1	37.76	62.15	7.1	57.70	45.22	7.1	7.54	18.68	7.1	5.25	39.53
8.0	27.76	50.98	8.1	37.70	61.89	8.1	57.52	44.91	8.1	7.48	18.40	8.1	5.01	39.30
9.0	27.69	50.71	9.1	37.64	61.65	9.1	57.37	44.58	9.1	7.41	18.08	9.1	4.77	39.10
10.0	27.60	50.45	10.1	37.57	61.41	10.1	57.24	44.25	10.1	7.36	17.77	10.1	4.52	38.88
11.0	27.53	50.16	11.1	37.50	61.14	11.1	57.13	43.93	11.1	7.31	17.45	11.1	4.27	38.66
12.0	27.45	49.87	12.1	37.44	60.88	12.1	57.04	43.60	12.1	7.28	17.14	12.1	4.00	38.44
13.0	27.37	49.58	13.1	37.37	60.62	13.1	56.99	43.27	13.1	7.27	16.84	13.1	3.74	38.20
14.0	27.29	49.25	14.1	37.30	60.33	14.1	56.95	42.97	14.1	7.26	16.55	14.1	3.47	37.96
15.0	27.23	48.91	15.1	37.23	60.02	15.1	56.92	42.68	15.1	7.25	16.27	15.1	3.21	37.70
16.0	27.17	48.58	16.0	37.17	59.71	16.1	56.89	42.39	16.1	7.23	15.99	16.1	2.96	37.42
17.0	27.12	48.21	17.0	37.12	59.39	17.1	56.85	42.12	17.1	7.21	15.71	17.1	2.72	37.13
18.0	27.09	47.86	18.0	37.06	59.07	18.1	56.81	41.84	18.1	7.18	15.45	18.1	2.49	36.83
18.9	27.06	47.51	19.0	37.01	58.74	19.1	56.73	41.55	19.1	7.15	15.19	19.1	2.30	36.53
19.9	27.05	47.18	20.0	36.97	58.41	20.0	56.64	41.26	20.1	7.13	14.92	20.1	2.12	36.24
20.9	27.04	46.87	21.0	36.94	58.12	21.0	56.56	40.94	21.1	7.08	14.61	21.1	1.97	35.96
21.9	27.03	46.57	22.0	36.91	57.84	22.0	56.50	40.60	22.1	7.05	14.30	22.1	1.82	35.71
22.9	27.02	46.31	23.0	36.87	57.58	23.0	56.45	40.24	23.0	7.04	13.96	23.0	1.65	35.47
23.9	26.98	46.03	24.0	36.83	57.32	24.0	56.44	39.87	24.0	7.03	13.59	24.0	1.48	35.24
24.9	26.94	45.75	25.0	36.79	57.05	25.0	56.48	39.50	25.0	7.04	13.24	25.0	1.30	35.00
25.9	26.91	45.44	26.0	36.75	56.78	26.0	56.54	39.16	26.0	7.07	12.90	26.0	1.10	34.76
26.9	26.88	45.13	27.0	36.71	56.47	27.0	56.63	38.82	27.0	7.10	12.59	27.0	0.89	34.49
27.9	26.87	44.79	28.0	36.67	56.15	28.0	56.72	38.51	28.0	7.14	12.29	28.0	0.69	34.19
28.9	26.85	44.44	29.0	36.63	55.80	29.0	56.80	38.22	29.0	7.18	12.00	29.0	0.49	33.87
29.9	26.86	44.07	30.0	36.59	55.46	30.0	56.86	37.93	30.0	7.19	11.74	30.0	0.34	33.55
30.9	26.88	43.71	31.0	36.58	55.10	31.0	56.90	37.64	31.0	7.20	11.46	31.0	0.20	33.22
31.9	26.91	43.38	32.0	36.57	54.76	32.0	56.93	37.35	32.0	7.21	11.18	32.0	0.10	32.89
	11.10	−11.05		6.21	−6.13		20.32	+20.29		7.73	+7.67		18.55	−18.53
	$5^h\ 45^m\ 51^s.396$			$6^h\ 46^m\ 48^s.653$			$7^h\ 3^m\ 2^s.335$			$7^h\ 14^m\ 7^s.912$			$7^h\ 15^m\ 39^s.691$	
		−84° 49′ 44″.27			−80° 43′ 46″.14			+87° 10′ 43″.86			+82° 34′ 17″.32			−86° 54′ 19″.75

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	8 17	+88 52	June	9 8	−85 20	June	9 25	+81 41	June	9 36	−80 35	June	10 21	+82 58
	s	″		s	″		s	″		s	″		s	″
1.2	39.39	42.06	1.2	31.50	58.93	1:2	40.68	14.52	1.2	16.78	12.99	1.2	21.90	22.44
2.2	38.78	41.86	2.2	31.22	58.84	2.2	40.58	14.39	2.2	16.64	12.94	2.2	21.77	22.38
3.1	38.13	41.66	3.2	30.94	58.73	3.2	40.47	14.29	3.2	16.50	12.86	3.2	21.62	22.31
4.1	37.43	41.46	4.2	30.69	58.62	4.2	40.37	14.16	4.2	16.37	12.78	4.2	21.48	22.25
5.1	36.67	41.26	5.2	30.44	58.50	5.2	40.24	14.04	5.2	16.25	12.69	5.2	21.32	22.20
6.1	35.88	41.04	6.2	30.19	58.39	6.2	40.11	13.92	6.2	16.13	12.60	6.2	21.15	22.13
7.1	35.09	40.80	7.2	29:97	58.27	7.2	39.95	13.78	7.2	16.02	12.52	7.2	20.98	22.05
8.1	34.32	40.53	8.2	29.76	58.17	8.2	39.85	13.61	8.2	15.91	12.44	8.2	20.80	21.96
9.1	33.57	40.25	9.2	29.53	58.08	9.2	39.72	13.43	9.2	15.81	12.38	9.2	20.62	21.84
10.1	32.89	39.97	10.2	29.31	57.98	10.2	39.62	13.24	10.2	15.70	12.31	10.2	20.46	21.71
11.1	32.26	39.69	11.2	29.09	57.88	11.2	39.50	13.04	11.2	15.59	12.25	11.2	20.31	21.58
12.1	31.69	39.40	12.2	28.87	57.79	12.2	39.40	12.82	12.2	15.48	12.18	12.2	20.16	21.44
13.1	31.18	39.11	13.2	28.63	57.69	13.2	39.30	12.60	13.2	15.37	12.10	13.2	20.01	21.28
14.1	30.72	38.82	14.2	28.38	57.57	14.2	39.21	12.38	14.2	15.24	12.02	14.2	19.88	21.12
15.1	30.29	38.53	15.1	28.13	57.43	15.2	39.13	12.18	15.2	15.12	11.92	15.2	19.75	20.97
16.1	29.88	38.26	16.1	27.88	57.28	16.2	39.05	11.98	16.2	15.00	11.79	16.2	19.63	20.83
17.1	29.46	38.01	17.1	27.64	57.12	17.2	38.97	11.79	17.2	14.87	11.66	17.2	19.51	20.69
18.1	29.01	37.76	18.1	27.39	56.93	18.2	38.89	11.61	18.2	14.75	11.51	18.2	19.39	20.56
19.1	28.52	37.51	19.1	27.16	56.75	19.2	38.80	11.43	19.2	14.64	11.33	19.2	19.25	20.43
20.1	27.98	37.24	20.1	26.97	56.56	20.1	38.70	11.24	20.2	14.53	11.18	20.2	19.12	20.31
21.1	27.42	36.96	21.1	26.76	56.38	21.1	38.59	11.02	21.2	14.43	11.03	21.2	18.96	20.17
22.1	26.88	36.64	22.1	26.58	56.20	22.1	38.48	10.80	22.1	14.33	10.88	22.2	18.80	20.00
23.1	26.37	36.33	23.1	26.40	56.06	23.1	38.38	10.56	23.1	14.24	10.74	23.2	18.65	19.81
24.1	25.93	35.97	24.1	26.22	55.93	24.1	38.28	10.28	24.1	14.15	10.63	24.2	18.50	19.58
25.1	25.59	35.61	25.1	26.02	55.81	25.1	38.20	10.01	25.1	14.06	10.52	25.2	18.36	19.36
26.1	25.34	35.26	26.1	25.82	55.67	26.1	38.14	9.71	26.1	13.96	10.40	26.2	18.25	19.13
27.1	25.16	34.93	27.1	25.60	55.50	27.1	38.09	9.42	27.1	13.86	10.27	27.2	18.15	18.89
28.1	25.01	34.61	28.1	25.37	55.33	28.1	38.04	9.15	28.1	13.75	10.12	28.2	18.06	18.65
29.1	24.86	34.33	29.1	25.15	55.13	29.1	37.99	8.91	29.1	13.63	9.94	29.2	17.97	18.44
30.1	24.68	34.04	30.1	24.94	54.90	30.1	37.94	8.67	30.1	13.53	9.74	30.2	17.87	18.24
31.1	24.45	33.76	31.1	24.74	54.65	31.1	37.88	8.44	31.1	13.42	9.51	31.2	17.76	18.04
32.1	24.17	33.48	32.1	24.56	54.41	32.1	37.81	8.21	32.1	13.32	9.28	32.2	17.63	17.85
51.04		+51.03	12.33		−12.29	6.92		+6.84	6.11		−6.03	8.17		+8.11
8^h	17^m	$47^s.546$	9^h	8^m	$41^s.594$	9^h	25^m	$39^s.275$	9^h	36^m	$19^s.026$	10^h	21^m	$19^s.949$
+88°	52′	37″.80	−85°	20′	26″.78	+81°	41′	10″.13	−80°	34′	39″.26	+82°	58′	17″.67

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			**Bradley 1672.** Mag. 6.3			**ι Octantis.** Mag. 5.4			**32 H. Camelop. *seq.*** Mag. 5.3			**κ Octantis.** Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	10 59	−84 10	June	12 14	+88 9	June	12 46	−84 41	June	12 48	+83 51	June	13 27	−85 22
	s	″		s	″		s	″		s	″		s	″
1.3	57.84	4.78	1.3	35.71	0.95	1.3	33.78	32.54	1.3	35.27	15.37	1.4	53.67	46.86
2.3	57.62	4.86	2.3	35.16	1.01	2.3	33.60	32.77	2.3	35.12	15.48	2.4	53.50	47.15
3.3	57.40	4.92	3.3	34.61	1.10	3.3	33.41	32.97	3.3	34.97	15.61	3.4	53.32	47.40
4.3	57.18	4.97	4.3	34.03	1.18	4.3	33.22	33.17	4.3	34.80	15.74	4.4	53.13	47.64
5.3	56.98	5.01	5.3	33.42	1.27	5.3	33.03	33.35	5.3	34.63	15.87	5.4	52.94	47.84
6.3	56.79	5.03	6.3	32.77	1.36	6.3	32.85	33.50	6.3	34.45	16.01	6.4	52.76	48.05
7.2	56.60	5.06	7.3	32.08	1.42	7.3	32.68	33.65	7.3	34.25	16.15	7.4	52.61	48.25
8.2	56.41	5.09	8.3	31.38	1.49	8.3	32.52	33.80	8.3	34.05	16.28	8.3	52.45	48.44
9.2	56.24	5.13	9.3	30.66	1.53	9.3	32.36	33.97	9.3	33.85	16.39	9.3	52.29	48.64
10.2	56.06	5.18	10.3	29.95	1.55	10.3	32.21	34.14	10.3	33.64	16.47	10.3	52.15	48.86
11.2	55.88	5.22	11.3	29.24	1.56	11.3	32.06	34.31	11.3	33.45	16.53	11.3	52.00	49.08
12.2	55.69	5.26	12.3	28.55	1.57	12.3	31.89	34.49	12.3	33.25	16.59	12.3	51.84	49.30
13.2	55.51	5.31	13.3	27.88	1.56	13.3	31.72	34.67	13.3	33.05	16.65	13.3	51.67	49.53
14.2	55.31	5.36	14.3	27.24	1.53	14.3	31.54	34.86	14.3	32.87	16.69	14.3	51.50	49.76
15.2	55.10	5.39	15.3	26.63	1.50	15.3	31.36	35.04	15.3	32.69	16.71	15.3	51.31	49.99
16.2	54.88	5.40	16.3	26.03	1.48	16.3	31.15	35.20	16.3	32.52	16.74	16.3	51.09	50.21
17.2	54.65	5.40	17.3	25.44	1.47	17.3	30.93	35.35	17.3	32.35	16.78	17.3	50.87	50.41
18.2	54.45	5.37	18.3	24.85	1.47	18.3	30.71	35.48	18.3	32.18	16.83	18.3	50.65	50.60
19.2	54.24	5.33	19.3	24.25	1.47	19.3	30.49	35.59	19.3	32.00	16.88	19.3	50.43	50.76
20.2	54.03	5.28	20.3	23.61	1.47	20.3	30.29	35.69	20.3	31.82	16.93	20.3	50.20	50.91
21.2	53.84	5.23	21.3	22.93	1.47	21.3	30.10	35.78	21.3	31.62	16.98	21.3	50.00	51.05
22.2	53.66	5.18	22.3	22.20	1.43	22.3	29.92	35.86	22.3	31.39	17.04	22.3	49.81	51.17
23.2	53.49	5.15	23.3	21.46	1.39	23.3	29.75	35.95	23.3	31.19	17.06	23.3	49.63	51.31
24.2	53.33	5.14	24.3	20.72	1.32	24.3	29.59	36.05	24.3	30.97	17.06	24.3	49.47	51.46
25.2	53.16	5.14	25.3	20.00	1.23	25.3	29.42	36.18	25.3	30.76	17.03	25.3	49.30	51.63
26.2	52.98	5.14	26.2	19.32	1.12	26.3	29.25	36.32	26.3	30.56	16.98	26.3	49.12	51.81
27.2	52.79	5.13	27.2	18.67	0.99	27.3	29.06	36.46	27.3	30.37	16.93	27.3	48.93	51.99
28.2	52.59	5.10	28.2	18.07	0.88	28.3	28.84	36.58	28.3	30.19	16.87	28.3	48.71	52.17
29.2	52.37	5.04	29.2	17.51	0.78	29.3	28.62	36.69	29.3	30.01	16.81	29.3	48.48	52.33
30.2	52.15	4.96	30.2	16.95	0.70	30.3	28.38	36.76	30.3	29.84	16.77	30.3	48.23	52.47
31.2	51.95	4.87	31.2	16.36	0.62	31.3	28.15	36.82	31.3	29.67	16.76	31.3	47.97	52.58
32.2	51.76	4.74	32.2	15.77	0.56	32.3	27.93	36.86	32.3	29.48	16.74	32.3	47.72	52.69
	9.84	−9.79		30.98	+30.97		10.81	−10.77		9.34	+9.29		12.42	−12.38
10^{h}	59^{m}	$54^{s}.546$	12^{h}	14^{m}	$29^{s}.190$	12^{h}	46^{m}	$19^{s}.119$	12^{h}	48^{m}	$31^{s}.308$	13^{h}	27^{m}	$32^{s}.891$
−84°	9′	29″.33	+88°	8′	56″.19	−84°	41′	1″.57	+83°	51′	11″.30	−85°	22′	19″.48

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			50 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	14 14	−83 18	June	15 3	+87 32	June	15 24	−84 12	June	16 54	+82 10	June	17 16	−80 47
	s	″		s	″		s	″		s	″		s	″
1.4	4.22	16.91	1.4	12.17	44.73	1.4	47.28	8.40	1.5	17.83	20.78	1.5	33.97	10.61
2.4	4.14	17.22	2.4	11.92	44.96	2.4	47.25	8.74	2.5	17.82	21.07	2.5	34.03	10.93
3.4	4.04	17.51	3.4	11.68	45.20	3.4	47.21	9.07	3.5	17.82	21.36	3.5	34.08	11.25
4.4	3.94	17.79	4.4	11.44	45.47	4.4	47.16	9.38	4.5	17.81	21.68	4.5	34.12	11.54
5.4	3.84	18.03	5.4	11.18	45.73	5.4	47.11	9.67	5.5	17.81	22.01	5.5	34.15	11.83
6.4	3.76	18.26	6.4	10.91	46.00	6.4	47.06	9.95	6.5	17.80	22.35	6.5	34.18	12.11
7.4	3.67	18.49	7.4	10.60	46.28	7.4	47.01	10.22	7.5	17.79	22.71	7.5	34.21	12.37
8.4	3.59	18.72	8.4	10.28	46.56	8.4	46.97	10.49	8.5	17.75	23.07	8.5	34.25	12.62
9.4	3.52	18.95	9.4	9.92	46.84	9.4	46.93	10.75	9.5	17.72	23.44	9.5	34.28	12.86
10.4	3.44	19.19	10.4	9.55	47.10	10.4	46.91	11.03	10.5	17.68	23.77	10.5	34.32	13.13
11.4	3.38	19.42	11.4	9.17	47.34	11.4	46.88	11.31	11.5	17.64	24.11	11.5	34.37	13.39
12.4	3.30	19.69	12.4	8.78	47.57	12.4	46.85	11.60	12.5	17.59	24.45	12.5	34.42	13.66
13.4	3.22	19.96	13.4	8.39	47.78	13.4	46.82	11.90	13.5	17.54	24.77	13.5	34.47	13.95
14.4	3.13	20.22	14.4	8.01	47.97	14.4	46.78	12.20	14.5	17.48	25.07	14.5	34.52	14.25
15.4	3.03	20.48	15.4	7.64	48.17	15.4	46.72	12.51	15.5	17.44	25.35	15.5	34.56	14.57
16.4	2.92	20.74	16.4	7.29	48.34	16.4	46.66	12.82	16.5	17.39	25.64	16.5	34.60	14.89
17.4	2.81	20.98	17.4	6.95	48.53	17.4	46.58	13.12	17.5	17.35	25.91	17.5	34.61	15.21
18.4	2.68	21.22	18.4	6.61	48.71	18.4	46.48	13.41	18.5	17.30	26.20	18.5	34.63	15.52
19.4	2.54	21.42	19.4	6.26	48.91	19.4	46.38	13.68	19.5	17.25	26.49	19.5	34.63	15.82
20.3	2.41	21.62	20.4	5.90	49.14	20.4	46.29	13.93	20.5	17.20	26.81	20.5	34.63	16.09
21.3	2.30	21.80	21.4	5.51	49.36	21.4	46.19	14.17	21.5	17.15	27.14	21.5	34.62	16.36
22.3	2.19	21.97	22.4	5.09	49.59	22.4	46.11	14.40	22.5	17.08	27.47	22.5	34.63	16.60
23.3	2.08	22.14	23.4	4.62	49.79	23.4	46.05	14.62	23.5	17.02	27.81	23.5	34.64	16.85
24.3	1.99	22.33	24.4	4.15	49.99	24.4	45.98	14.86	24.4	16.93	28.15	24.5	34.66	17.11
25.3	1.90	22.52	25.4	3.64	50.17	25.4	45.93	15.10	25.4	16.84	28.46	25.5	34.69	17.37
26.3	1.81	22.74	26.4	3.15	50.31	26.4	45.87	15.38	26.4	16.75	28.76	26.5	34.73	17.65
27.3	1.71	22.97	27.4	2.67	50.45	27.4	45.79	15.66	27.4	16.66	29.03	27.5	34.74	17.96
28.3	1.57	23.19	28.4	2.23	50.56	28.4	45.71	15.95	28.4	16.57	29.27	28.5	34.76	18.28
29.3	1.44	23.40	29.4	1.80	50.66	29.4	45.61	16.24	29.4	16.49	29.52	29.4	34.77	18.60
30.3	1.29	23.60	30.4	1.39	50.79	30.4	45.48	16.51	30.4	16.40	29.76	30.4	34.76	18.92
31.3	1.14	23.78	31.4	0.98	50.93	31.4	45.35	16.75	31.4	16.32	30.01	31.4	34.73	19.22
32.3	0.98	23.92	32.3	0.58	51.07	32.4	45.21	16.98	32.4	16.24	30.28	32.4	34.70	19.50
8.58		−8.52	23.36		+23.34	9.90		−9.85	7.34		+7.28	6.25		−6.17
14ʰ	13ᵐ	46ˢ.350	15ʰ	3ᵐ	2ˢ.510	15ʰ	24ᵐ	23ˢ.351	16ʰ	54ᵐ	12ˢ.991	17ʰ	16ᵐ	17ˢ.234
−83°	17′	54″.52	+87°	32′	42″.66	−84°	11′	55″.43	+82°	10′	21″.42	−80°	47′	14″.27

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			**χ Octantis.** Mag. 5.2			**λ Ursæ Minoris.** Mag. 6.6			**σ Octantis.** Mag. 5.5			**76 Draconis.** Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	17 58	+86 36	June	18 8	−87 39	June	19 0	+89 1	June	19 33	−89 12	June	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
1.6	30.15	49.22	1.6	19.92	39.21	1.6	34.14	9.81	1.6	3.99	50.39	1.7	35.64	52.02
2.6	30.20	49.50	2.6	20.24	39.51	2.6	34.59	10.08	2.6	5.43	50.60	2.7	35.77	52.22
3.6	30.27	49.78	3.6	20.52	39.81	3.6	35.08	10.34	3.6	6.74	50.82	3.7	35.89	52.40
4.5	30.35	50.08	4.6	20.77	40.11	4.6	35.60	10.60	4.6	7.94	51.04	4.7	36.01	52.60
5.5	30.42	50.40	5.6	21.00	40.39	5.6	36.16	10.88	5.6	9.06	51.27	5.7	36.13	52.81
6.5	30.48	50.74	6.5	21.20	40.65	6.6	36.73	11.17	6.6	10.12	51.49	6.7	36.27	53.03
7.5	30.54	51.08	7.5	21.42	40.92	7.6	37.26	11.49	7.6	11.15	51.69	7.7	36.41	53.25
8.5	30.59	51.45	8.5	21.64	41.17	8.6	37.75	11.82	8.6	12.20	51.88	8.7	36.54	53.52
9.5	30.61	51.81	9.5	21.86	41.41	9.6	38.18	12.16	9.6	13.27	52.06	9.7	36.67	53.79
10.5	30.62	52.15	10.5	22.10	41.66	10.6	38.53	12.50	10.6	14.39	52.25	10.6	36.80	54.06
11.5	30.62	52.50	11.5	22.35	41.93	11.6	38.84	12.84	11.6	15.54	52.44	11.6	36.91	54.34
12.5	30.59	52.85	12.5	22.62	42.20	12.6	39.07	13.18	12.6	16.72	52.64	12.6	37.02	54.62
13.5	30.55	53.19	13.5	22.89	42.48	13.6	39.26	13.51	13.6	17.93	52.86	13.6	37.13	54.90
14.5	30.51	53.51	14.5	23.14	42.79	14.6	39.40	13.83	14.6	19.15	53.09	14.6	37.23	55.19
15.5	30.47	53.82	15.5	23.38	43.10	15.6	39.53	14.13	15.6	20.34	53.33	15.6	37.33	55.47
16.5	30.42	54.11	16.5	23.58	43.42	16.6	39.67	14.42	16.6	21.49	53.59	16.6	37.41	55.73
17.5	30.38	54.39	17.5	23.76	43.75	17.6	39.83	14.70	17.6	22.55	53.86	17.6	37.51	55.98
18.5	30.37	54.70	18.5	23.91	44.07	18.6	40.02	14.98	18.6	23.51	54.14	18.6	37.60	56.22
19.5	30.34	55.01	19.5	24.02	44.38	19.5	40.24	15.27	19.6	24.38	54.41	19.6	37.70	56.48
20.5	30.31	55.33	20.5	24.12	44.67	20.5	40.48	15.59	20.6	25.16	54.65	20.6	37.80	56.76
21.5	30.28	55.69	21.5	24.21	44.96	21.5	40.73	15.93	21.6	25.89	54.90	21.6	37.91	57.05
22.5	30.23	56.05	22.5	24.30	45.23	22.5	40.91	16.29	22.6	26.62	55.14	22.6	38.02	57.36
23.5	30.15	56.42	23.5	24.43	45.49	23.5	41.01	16.66	23.6	27.40	55.34	23.6	38.12	57.68
24.5	30.06	56.79	24.5	24.57	45.76	24.5	41.01	17.03	24.6	28.27	55.56	24.6	38.21	58.02
25.5	29.93	57.13	25.5	24.75	46.03	25.5	40.92	17.40	25.6	29.22	55.78	25.6	38.30	58.39
26.5	29.80	57.47	26.5	24.93	46.31	26.5	40.75	17.74	26.6	30.21	56.02	26.6	38.38	58.74
27.5	29.66	57.77	27.5	25.09	46.62	27.5	40.55	18.07	27.5	31.21	56.29	27.6	38.44	59.08
28.5	29.51	58.05	28.5	25.24	46.95	28.5	40.34	18.40	28.5	32.17	56.57	28.6	38.50	59.41
29.5	29.38	58.33	29.5	25.34	47.29	29.5	40.15	18.71	29.5	33.04	56.85	29.6	38.55	59.70
30.5	29.27	58.61	30.5	25.40	47.61	30.5	40.03	19.01	30.5	33.79	57.16	30.6	38.62	59.99
31.5	29.17	58.90	31.5	25.41	47.95	31.5	39.96	19.31	31.5	34.42	57.48	31.6	38.68	60.28
32.5	29.07	59.21	32.5	25.40	48.27	32.5	39.91	19.63	32.5	34.94	57.78	32.6	38.74	60.57
	16.94	+16.91		24.51	−24.49		58.50	+58.49		72.97	−72.97		7.40	+7.33
$17^h\ 58^m\ 22^s.311$			$18^h\ 7^m\ 23^s.343$			$19^h\ 0^m\ 15^s.079$			$19^h\ 30^m\ 50^s.769$			$20^h\ 48^m\ 32^s.146$		
+86° 36′ 51″.04			−87° 39′ 50″.89			+89° 1′ 12″.80			−89° 13′ 13″.35			+82° 13′ 56″.82		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ¹ Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	21 38	−83 5	June	22 16	−86 22	June	22 37	−81 47	June	23 27	+86 51	June	23 47	−82 27
	s	″		s	″		s	″		s	″		s	″
1.7	46.74	1.14	1.7	40.78	16.13	1.7	54.69	50.08	1.8	44.65	33.36	1.8	21.40	34.71
2.7	46.94	1.16	2.7	41.18	16.09	2.7	54.87	50.00	2.8	45.00	33.37	2.8	21.57	34.52
3.7	47.14	1.19	3.7	41.56	16.09	3.7	55.04	49.95	3.8	45.35	33.38	3.8	21.75	34.37
4.7	47.33	1.24	4.7	41.93	16.10	4.7	55.21	49.90	4.8	45.71	33.36	4.8	21.92	34.23
5.7	47.51	1.30	5.7	42.26	16.11	5.7	55.35	49.88	5.8	46.11	33.35	5.8	22.06	34.10
6.7	47.68	1.34	6.7	42.58	16.12	6.7	55.49	49.84	6.8	46.52	33.34	6.8	22.21	33.99
7.7	47.84	1.39	7.7	42.90	16.12	7.7	55.63	49.80	7.8	46.94	33.34	7.8	22.35	33.87
8.7	48.00	1.43	8.7	43.21	16.12	8.7	55.77	49.76	8.8	47.38	33.38	8.8	22.49	33.75
9.7	48.17	1.45	9.7	43.51	16.10	9.7	55.91	49.72	9.8	47.80	33.41	9.8	22.63	33.61
10.7	48.34	1.47	10.7	43.83	16.10	10.7	56.06	49.67	10.8	48.24	33.46	10.8	22.79	33.48
11.7	48.52	1.50	11.7	44.16	16.08	11.7	56.21	49.62	11.8	48.67	33.55	11.8	22.94	33.34
12.7	48.70	1.54	12.7	44.51	16.06	12.7	56.38	49.56	12.8	49.09	33.64	12.8	23.11	33.20
13.7	48.89	1.58	13.7	44.87	16.05	13.7	56.55	49.52	13.8	49.47	33.73	13.8	23.27	33.05
14.7	49.09	1.62	14.7	45.24	16.05	14.7	56.72	49.49	14.7	49.85	33.83	14.8	23.45	32.91
15.7	49.29	1.69	15.7	45.61	16.07	15.7	56.89	49.48	15.7	50.22	33.93	15.8	23.62	32.78
16.7	49.49	1.77	16.7	45.99	16.10	16.7	57.07	49.47	16.7	50.57	34.03	16.8	23.81	32.68
17.7	49.67	1.87	17.7	46.36	16.16	17.7	57.23	49.48	17.7	50.92	34.11	17.8	23.99	32.60
18.7	49.86	1.98	18.7	46.71	16.24	18.7	57.40	49.52	18.7	51.27	34.19	18.8	24.17	32.54
19.7	50.03	2.11	19.7	47.04	16.32	19.7	57.55	49.56	19.7	51.63	34.27	19.7	24.35	32.48
20.7	50.17	2.24	20.7	47.36	16.41	20.7	57.69	49.62	20.7	52.03	34.35	20.7	24.50	32.44
21.7	50.32	2.35	21.7	47.64	16.48	21.7	57.84	49.65	21.7	52.44	34.43	21.7	24.65	32.39
22.7	50.46	2.46	22.7	47.93	16.54	22.7	57.97	49.66	22.7	52.86	34.54	22.7	24.80	32.34
23.6	50.61	2.55	23.7	48.22	16.60	23.7	58.10	49.68	23.7	53.29	34.67	23.7	24.94	32.28
24.6	50.78	2.62	34.7	48.54	16.65	24.7	58.25	49.69	24.7	53.72	34.83	24.7	25.09	32.20
25.6	50.95	2.69	25.7	48.85	16.69	25.7	58.39	49.68	25.7	54.14	35.01	25.7	25.26	32.11
26.6	51.13	2.76	26.7	49.18	16.73	26.7	58.56	49.68	26.7	54.52	35.20	26.7	25.43	32.02
27.6	51.31	2.86	27.7	49.55	16.80	27.7	58.73	49.70	27.7	54.86	35.39	27.7	25.61	31.93
28.6	51.50	3.00	28.7	49.91	16.88	28.7	58.91	49.74	28.7	55.19	35.57	28.7	25.79	31.87
29.6	51.68	3.13	29.7	50.27	16.97	29.7	59.08	49.80	29.7	55.52	35.74	29.7	25.99	31.83
30.6	51.86	3.30	30.7	50.61	17.09	30.7	59.22	49.89	30.7	55.84	35.88	30.7	26.18	31.82
31.6	52.01	3.49	31.7	50.93	17.22	31.7	59.38	50.01	31.7	56.16	36.02	31.7	26.35	31.82
32.6	52.15	3.69	32.6	51.23	17.37	32.7	59.53	50.12	32.7	56.50	36.16	32.7	26.52	31.86
	8.30	−8.24		15.80	−15.77		7.01	−6.94		18.25	+18.23		7.62	−7.55
21^h	38^m	$38^s.548$	22^h	16^m	$33^s.212$	22^h	37^m	$51^s.624$	23^h	27^m	$43^s.571$	23^h	47^m	$23^s.637$
−83°	5′	34″.33	−86°	22′	50″.92	−81°	48′	24″.80	+86°	51′	38″.62	−82°	28′	8″.42

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (*Polaris.*) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	0 57	+85 49	July	1 31	+88 52	July	1 41	−85 10	July	4 10	+85 20	July	5 35	+85 9
	s	″		s	″		s	″		s	″		s	″
0.8	32.94	18.61	0.8	32.65	14.04	0.8	43.55	13.00	0.9	40.29	20.51	0.9	50.35	26.66
1.8	33.22	18.64	1.8	33.66	14.01	1.8	43.80	12.85	1.9	40.48	20.32	1.9	50.46	26.39
2.8	33.51	18.66	2.8	34.71	13.98	2.8	44.04	12.72	2.9	40.67	20.10	2.9	50.55	26.12
3.8	33.81	18.69	3.8	35.81	13.95	3.8	44.28	12.61	3.9	40.86	19.87	3.9	50.66	25.83
4.8	34.13	18.73	4.8	36.97	13.94	4.8	44.50	12.51	4.9	41.05	19.64	4.9	50.78	25.52
5.8	34.45	18.77	5.8	38.16	13.92	5.8	44.72	12.41	5.9	41.28	19.42	5.9	50.91	25.21
6.8	34.78	18.83	6.8	39.40	13.91	6.8	44.92	12.30	6.9	41.51	19.19	6.9	51.05	24.91
7.7	35.13	18.91	7.8	40.65	13.92	7.8	45.13	12.20	7.9	41.75	18.99	7.9	51.22	24.62
8.7	35.47	18.99	8.8	41.87	13.95	8.8	45.35	12.09	8.9	42.02	18.80	8.9	51.39	24.33
9.7	35.80	19.09	9.8	43.10	14.00	9.8	45.58	11.96	9.9	42.28	18.61	9.9	51.57	24.06
10.7	36.12	19.22	10.8	44.30	14.09	10.8	45.80	11.84	10.9	42.55	18.46	10.9	51.76	23.79
11.7	36.43	19.35	11.8	45.45	14.18	11.8	46.04	11.72	11.9	42.82	18.31	11.9	51.95	23.55
12.7	36.72	19.49	12.8	46.57	14.27	12.8	46.29	11.59	12.9	43.07	18.17	12.9	52.14	23.31
13.7	37.01	19.62	13.8	47.64	14.35	13.8	46.56	11.49	13.9	43.32	18.03	13.9	52.33	23.08
14.7	37.28	19.75	14.8	48.67	14.41	14.8	46.82	11.39	14.9	43.56	17.91	14.9	52.51	22.87
15.7	37.55	19.88	15.8	49.68	14.48	15.8	47.09	11.30	15.9	43.78	17.77	15.9	52.66	22.65
16.7	37.82	19.99	16.7	50.71	14.54	16.8	47.35	11.25	16.9	44.01	17.63	16.9	52.82	22.42
17.7	38.10	20.08	17.7	51.79	14.58	17.8	47.60	11.23	17.9	44.24	17.49	17.9	52.99	22.19
18.7	38.40	20.18	18.7	52.93	14.63	18.7	47.85	11.22	18.9	44.48	17.31	18.9	53.16	21.92
19.7	38.72	20.29	19.7	54.13	14.67	19.7	48.08	11.18	19.8	44.74	17.14	19.9	53.34	21.64
20.7	39.05	20.42	20.7	55.39	14.75	20.7	48.29	11.15	20.8	45.02	16.96	20.9	53.53	21.35
21.7	39.39	20.58	21.7	56.69	14.85	21.7	48.51	11.13	21.8	45.33	16.81	21.9	53.76	21.08
22.7	39.73	20.76	22.7	57.96	14.99	22.7	48.72	11.08	22.8	45.65	16.68	22.9	54.00	20.84
23.7	40.05	20.98	23.7	59.19	15.13	23.7	48.95	11.02	23.8	45.96	16.58	23.9	54.26	20.61
24.7	40.36	21.20	24.7	60.36	15.30	24.7	49.18	10.95	24.8	46.27	16.49	24.9	54.51	20.41
25.7	40.64	21.40	25.7	61.45	15.48	25.7	49.45	10.89	25.8	46.56	16.43	25.9	54.76	20.22
26.7	40.91	21.61	26.7	62.47	15.63	26.7	49.73	10.83	26.8	46.85	16.37	26.9	55.00	20.04
27.7	41.15	21.83	27.7	63.46	15.78	27.7	50.00	10.81	27.8	47.12	16.31	27.9	55.20	19.87
28.7	41.39	22.00	28.7	64.44	15.89	28.7	50.28	10.80	28.8	47.36	16.25	28.9	55.41	19.70
29.7	41.65	22.17	29.7	65.45	16.00	29.7	50.54	10.83	29.8	47.63	16.16	29.9	55.61	19.50
30.7	41.93	22.32	30.7	66.49	16.11	30.7	50.79	10.87	30.8	47.89	16.06	30.9	55.81	19.30
31.7	42.20	22.49	31.7	67.59	16.22	31.7	51.02	10.93	31.8	48.15	15.95	31.9	56.02	19.08
	13.73	+13.69		50.74	+50.73		11.88	−11.83		12.30	+12.26		11.84	+11.80
	$0^h\ 57^m\ 24^s.633$			$1^h\ 31^m\ 11^s.709$			$1^h\ 41^m\ 54^s.846$			$4^h\ 10^m\ 37^s.831$			$5^h\ 35^m\ 50^s.330$	
		+85° 49′ 24″.14			+88° 52′ 20″.55			−85° 10′ 45″.22			+85° 20′ 28″.88			+85° 9′ 34″.51

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			**ζ Mensæ.** Mag. 5.6			**51 H. Cephei.** Mag. 5.3			**25 H. Camelop.** Mag. 5.1			**7 G. Octantis.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	5 45	−84 49	July	6 46	−80 43	July	7 2	+87 10	July	7 14	+82 34	July	7 14	−86 54
	s	″		s	″		s	″		s	″		s	″
0.9	26.88	43.71	1.0	36.58	55.10	1.0	56.90	37.64	1.0	7.20	11.46	1.0	60.20	33.22
1.9	26.91	43.38	2.0	36.57	54.76	2.0	56.93	37.35	2.0	7.21	11.18	2.0	60.10	32.89
2.9	26.95	43.06	3.0	36.55	54.43	3.0	56.94	37.04	3.0	7.22	10.87	3.0	60.01	32.59
3.9	26.99	42.74	4.0	36.55	54.11	4.0	56.95	36.73	4.0	7.21	10.56	4.0	59.95	32.30
4.9	27.04	42.46	4.9	36.54	53.82	5.0	56.99	36.39	5.0	7.22	10.24	5.0	59.89	32.01
5.9	27.08	42.17	5.9	36.54	53.52	6.0	57.02	36.05	6.0	7.23	9.90	6.0	59.82	31.74
6.9	27.13	41.90	6.9	36.54	53.23	7.0	57.10	35.70	7.0	7.25	9.57	7.0	59.76	31.47
7.9	27.17	41.61	7.9	36.54	52.94	8.0	57.18	35.35	8.0	7.28	9.22	8.0	59.67	31.19
8.9	27.20	41.32	8.9	36.53	52.64	8.9	57.30	35.01	[illegible].0	7.33	8.87	9.0	59.59	30.91
9.9	27.24	41.03	9.9	36.53	52.34	9.9	57.43	34.67	10.0	7.38	8.54	10.0	59.50	30.62
10.9	27.27	40.71	10.9	36.52	52.03	10.9	57.60	34.33	10.9	7.43	8.23	11.0	59.42	30.33
11.9	27.31	40.39	11.9	36.51	51.72	11.9	57.77	34.00	11.9	7.50	7.92	11.9	59.33	30.02
12.9	27.36	40.07	12.9	36.51	51.39	12.9	57.94	33.71	12.9	7.57	7.63	12.9	59.25	29.71
13.9	27.42	39.74	13.9	36.52	51.03	13.9	58.11	33.42	13.9	7.63	7.35	13.9	59.19	29.38
14.9	27.50	39.40	14.9	36.53	50.67	14.9	58.27	33.13	14.9	7.69	7.08	14.9	59.14	29.03
15.9	27.58	39.07	15.9	36.54	50.33	15.9	58.42	32.84	15.9	7.74	6.81	15.9	59.12	28.68
16.9	27.68	38.75	16.9	36.55	50.00	16.9	58.54	32.55	16.9	7.79	6.52	16.9	59.12	28.35
17.9	27.78	38.46	17.9	36.59	49.68	17.9	58.66	32.23	17.9	7.83	6.21	17.9	59.15	28.02
18.9	27.89	38.18	18.9	36.62	49.37	18.9	58.79	31.90	18.9	7.87	5.89	18.9	59.18	27.73
19.9	27.99	37.94	19.9	36.65	49.08	19.9	58.92	31.56	19.9	7.92	5.55	19.9	59.22	27.44
20.9	28.08	37.70	20.9	36.68	48.80	20.9	59.09	31.21	20.9	7.98	5.21	20.9	59.25	27.17
21.9	28.16	37.45	21.9	36.70	48.54	21.9	59.31	30.87	21.9	8.07	4.87	21.9	59.26	26.90
22.9	28.24	37.19	22.9	36.73	48.27	22.9	59.57	30.53	22.9	8.15	4.53	22.9	59.26	26.64
23.9	28.32	36.92	23.9	36.74	47.98	23.9	59.84	30.19	23.9	8.26	4.20	23.9	59.24	26.36
24.9	28.40	36.63	24.9	36.76	47.66	24.9	60.13	29.87	24.9	8.38	3.89	24.9	59.23	26.05
25.9	28.49	36.31	25.9	36.79	47.33	25.9	60.41	29.58	25.9	8.49	3.61	25.9	59.23	25.73
26.9	28.60	35.99	26.9	36.83	46.99	26.9	60.68	29.31	26.9	8.58	3.34	26.9	59.24	25.40
27.9	28.73	35.69	27.9	36.87	46.62	27.9	60.92	29.07	27.9	8.68	3.08	27.9	59.29	25.05
28.9	28.86	35.40	28.9	36.90	46.28	28.9	61.16	28.80	28.9	8.76	2.82	28.9	59.38	24.71
29.9	29.01	35.13	29.9	36.96	45.96	29.9	61.36	28.53	29.9	8.84	2.55	29.9	59.47	24.38
30.9	29.16	34.87	30.9	37.02	45.67	30.9	61.57	28.24	30.9	8.91	2.26	30.9	59.58	24.09
31.9	29.31	34.64	31.9	37.08	45.38	31.9	61.79	27.93	31.9	8.99	1.97	31.9	59.71	23.79
11.09		−11.05	6.21		−6.13	20.30		+20.27	7.73		+7.67	18.54		−18.51
$5^h\ 45^m\ 51^s.396$			$6^h\ 46^m\ 48^s.653$			$7^h\ 3^m\ 2^s.335$			$7^h\ 14^m\ 7^s.912$			$7^h\ 15^m\ 39^s.691$		
−84° 49′ 44″.27			−80° 43′ 46″.14			+87° 10′ 43″.86			+82° 34′ 17″.32			−86° 54′ 19″.75		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	8 17	+88 52	July	9 8	−85 20	July	9 25	+81 40	July	9 36	−80 35	July	10 21	+82 58
	s	″		s	″		s	″		s	″		s	″
1.1	24.45	33.76	1.1	24.74	54.65	1.1	37.88	68.44	1.1	13.42	9.51	1.2	17.76	18.04
2.1	24.17	33.48	2.1	24.56	54.41	2.1	37.81	68.21	2.1	13.32	9.28	2.2	17.63	17.85
3.1	23.85	33.17	3.1	24.39	54.16	3.1	37.73	67.96	3.1	13.23	9.05	3.2	17.51	17.66
4.1	23.52	32.85	4.1	24.24	53.92	4.1	37.65	67.70	4.1	13.14	8.83	4.1	17.37	17.46
5.1	23.20	32.51	5.1	24.09	53.70	5.1	37.57	67.43	5.1	13.06	8.61	5.1	17.24	17.24
6.1	22.91	32.18	6.1	23.96	53.48	6.1	37.48	67.16	6.1	12.99	8.41	6.1	17.12	17.02
7.1	22.68	31.84	7.1	23.81	53.26	7.1	37.42	66.87	7.1	12.91	8.21	7.1	16.99	16.78
8.1	22.49	31.48	8.1	23.67	53.05	8.1	37.36	66.56	8.1	12.85	8.02	8.1	16.89	16.50
9.0	22.37	31.11	9.1	23.53	52.8[illegible]	9.1	37.30	66.24	9.1	12.77	7.83	9.1	16.78	16.23
10.0	22.31	30.76	10.1	23.38	52.60	10.1	37.25	65.92	10.1	12.69	7.63	10.1	16.68	15.96
11.0	22.31	30.42	11.1	23.21	52.38	11.1	37.21	65.60	11.1	12.61	7.42	11.1	16.59	15.68
12.0	22.35	30.08	12.1	23.04	52.16	12.1	37.20	65.30	12.1	12.52	7.22	12.1	16.51	15.40
13.0	22.41	29.75	13.1	22.88	51.91	13.1	37.17	65.00	13.1	12.43	7.00	13.1	16.45	15.12
14.0	22.48	29.44	14.1	22.72	51.64	14.1	37.13	64.71	14.1	12.35	6.74	14.1	16.37	14.84
15.0	22.54	29.13	15.1	22.57	51.36	15.1	37.10	64.44	15.1	12.27	6.47	15.1	16.29	14.60
16.0	22.55	28.83	16.1	22.43	51.07	16.1	37.08	64.17	16.1	12.19	6.20	16.1	16.21	14.36
17.0	22.51	28.52	17.1	22.30	50.77	17.1	37.03	63.90	17.1	12.11	5.91	17.1	16.13	14.11
18.0	22.46	28.19	18.1	22.20	50.47	18.1	36.98	63.62	18.1	12.05	5.63	18.1	16.06	13.85
19.0	22.39	27.85	19.1	22.11	50.18	19.1	36.93	63.32	19.1	11.99	5.38	19.1	15.94	13.57
20.0	22.34	27.49	20.1	22.03	49.93	20.1	36.88	62.98	20.1	11.95	5.13	20.1	15.83	13.29
21.0	22.35	27.12	21.1	21.94	49.69	21.1	36.85	62.64	21.1	11.90	4.88	21.1	15.73	12.98
22.0	22.46	26.74	22.0	21.85	49.45	22.1	36.81	62.27	22.1	11.85	4.65	22.1	15.65	12.65
23.0	22.66	26.34	23.0	21.76	49.23	23.1	36.80	61.91	23.1	11.80	4.44	23.1	15.59	12.30
24.0	22.94	25.95	24.0	21.65	48.99	24.1	36.80	61.55	24.1	11.74	4.21	24.1	15.53	11.95
25.0	23.27	25.60	25.0	21.52	48.72	25.1	36.81	61.21	25.1	11.68	3.94	25.1	15.48	11.62
26.0	23.62	25.26	26.0	21.40	48.44	26.0	36.82	60.88	26.1	11.62	3.67	26.1	15.45	11.30
27.0	23.96	24.94	27.0	21.29	48.13	27.0	36.83	60.56	27.1	11.55	3.39	27.1	15.41	11.00
27.9	24.24	24.64	28.0	21.19	47.81	28.0	36.83	60.25	28.1	11.49	3.08	28.1	15.37	10.71
28.9	24.47	24.33	29.0	21.13	47.48	29.0	36.83	59.96	29.0	11.44	2.76	29.1	15.32	10.43
29.9	24.66	24.01	30.0	21.06	47.16	30.0	36.81	59.67	30.0	11.39	2.42	30.1	15.26	10.14
30.9	24.81	23.67	31.0	21.01	46.83	31.0	36.79	59.35	31.0	11.35	2.11	31.1	15.20	9.86
31.9	24.98	23.33	32.0	20.97	46.51	32.0	36.77	59.03	32.0	11.32	1.82	32.1	15.13	9.54
	50.92	+50.91		12.33	−12.29		6.91	+6.84		6.11	−6.03		8.17	+8.11
8^h	17^m	$47^s.546$	9^h	8^m	$41^s.594$	9^h	25^m	$39^s.275$	9^h	36^m	$19^s.026$	10^h	21^m	$19^s.949$
+88°	52′	37″.80	−85°	20′	26″.78	+81°	41′	10″.13	−80°	34′	39″.26	+82°	58′	17″.67

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	10 59	−84 9	July	12 13	+88 8	July	12 46	−84 41	July	12 48	+83 51	July	13 27	−85 22
	s	″		s	″		s	″		s	″		s	″
1.2	51.95	64.87	1.2	76.36	60.62	1.3	28.15	36.82	1.3	29.67	16.76	1.3	47.97	52.58
2.2	51.76	64.74	2.2	75.77	60.56	2.3	27.93	36.86	2.3	29.48	16.74	2.3	47.72	52.69
3.2	51.56	64.62	3.2	75.13	60.50	3.3	27.72	36.88	3.3	29.30	16.72	3.3	47.48	52.77
4.2	51.38	64.50	4.2	74.47	60.41	4.2	27.52	36.89	4.3	29.09	16.71	4.3	47.24	52.83
5.2	51.22	64.37	5.2	73.78	60.33	5.2	27.31	36.90	5.2	28.89	16.67	5.3	47.02	52.89
6.2	51.07	64.27	6.2	73.09	60.23	6.2	27.13	36.90	6.2	28.68	16.64	6.3	46.82	52.95
7.2	50.91	64.17	7.2	72.39	60.10	7.2	26.94	36.92	7.2	28.46	16.58	7.3	46.61	53.00
8.2	50.74	64.06	8.2	71.70	59.96	8.2	26.75	36.95	8.2	28.25	16.51	8.3	46.40	53.09
9.2	50.57	63.96	9.2	71.04	59.81	9.2	26.57	36.98	9.2	28.05	16.42	9.3	46.20	53.17
10.2	50.41	63.87	10.2	70.41	59.65	10.2	26.37	37.02	10.2	27.85	16.31	10.3	45.98	53.25
11.2	50.23	63.76	11.2	69.79	59.48	11.2	26.17	37.05	11.2	27.66	16.20	11.3	45.76	53.34
12.2	50.05	63.65	12.2	69.20	59.31	12.2	25.97	37.08	12.2	27.48	16.09	12.3	45.53	53.43
13.2	49.87	63.52	13.2	68.63	59.13	13.2	25.74	37.10	13.2	27.31	15.96	13.3	45.28	53.50
14.1	49.68	63.39	14.2	68.12	58.95	14.2	25.51	37.10	14.2	27.14	15.83	14.3	45.01	53.56
15.1	49.49	63.21	15.2	67.60	58.79	15.2	25.28	37.09	15.2	26.97	15.71	15.2	44.75	53.61
16.1	49.31	63.03	16.2	67.05	58.64	16.2	25.04	37.05	16.2	26.80	15.61	16.2	44.47	53.62
17.1	49.13	62.84	17.2	66.51	58.49	17.2	24.81	37.01	17.2	26.63	15.51	17.2	44.22	53.63
18.1	48.98	62.65	18.2	65.89	58.33	18.2	24.61	36.93	18.2	26.43	15.41	18.2	43.97	53.63
19.1	48.83	62.45	19.2	65.26	58.16	19.2	24.41	36.86	19.2	26.23	15.32	19.2	43.73	53.62
20.1	48.70	62.27	20.2	64.60	57.99	20.2	24.21	36.80	20.2	26.03	15.20	20.2	43.51	53.61
21.1	48.57	62.11	21.2	63.94	57.80	21.2	24.04	36.74	21.2	25.82	15.07	21.2	43.31	53.61
22.1	48.45	61.96	22.2	63.29	57.57	22.2	23.87	36.70	22.2	25.61	14.90	22.2	43.11	53.62
23.1	48.31	61.81	23.2	62.68	57.33	23.2	23.70	36.67	23.2	25.42	14.72	23.2	42.91	53.65
24.1	48.17	61.67	24.2	62.12	57.08	24.2	23.52	36.66	24.2	25.24	14.52	24.2	42.69	53.68
25.1	48.01	61.50	25.2	61.61	56.83	25.2	23.31	36.63	25.2	25.08	14.31	25.2	42.45	53.69
26.1	47.84	61.32	26.2	61.14	56.58	26.2	23.09	36.58	26.2	24.93	14.10	26.2	42.21	53.71
27.1	47.67	61.12	27.2	60.68	56.34	27.2	22.86	36.53	27.2	24.77	13.91	27.2	41.94	53.70
28.1	47.51	60.89	28.2	60.22	56.12	28.2	22.63	36.43	28.2	24.61	13.73	28.2	41.66	53.67
29.1	47.37	60.65	29.2	59.75	55.90	29.2	22.40	36.32	29.2	24.45	13.56	29.2	41.39	53.62
30.1	47.22	60.38	30.2	59.24	55.70	30.2	22.19	36.19	30.2	24.28	13.41	30.2	41.12	53.55
31.1	47.09	60.13	31.2	58.72	55.49	31.2	21.99	36.05	31.2	24.11	13.26	31.2	40.88	53.46
32.1	46.98	59.89	32.1	58.16	55.28	32.2	21.80	35.90	32.2	23.93	13.08	32.2	40.65	53.38
9.84		−9.79	30.97		+30.95	10.81		−10.77	9.34		+9.29	12.42		−12.38
10^{h}	59^{m}	$54^{\mathrm{s}}.546$	12^{h}	14^{m}	$29^{\mathrm{s}}.190$	12^{h}	46^{m}	$19^{\mathrm{s}}.119$	12^{h}	48^{m}	$31^{\mathrm{s}}.308$	13^{h}	27^{m}	$32^{\mathrm{s}}.891$
−84°	9′	29″.33	+88°	8′	56″.19	−84°	41′	1″.57	+83°	51′	11″.30	−85°	22′	19″.48

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	14 13	−83 18	July	15 2	+87 32	July	15 24	−84 12	July	16 54	+82 10	July	17 16	−80 47
	s	″		s	″		s	″		s	″		s	″
1.3	61.14	23.78	1.4	60.98	50.93	1.4	45.35	16.75	1.4	16.32	30.01	1.4	34.73	19.22
2.3	60.98	23.92	2.3	60.58	51.07	2.4	45.21	16.98	2.4	16.24	30.28	2.4	34.70	19.50
3.3	60.83	24.07	3.3	60.15	51.23	3.4	45.07	17.18	3.4	16.16	30.57	3.4	34.67	19.77
4.3	60.69	24.17	4.3	59.69	51.40	4.4	44.93	17.37	4.4	16.08	30.86	4.4	34.64	20.02
5.3	60.55	24.28	5.3	59.22	51.57	5.4	44.80	17.55	5.4	15.99	31.16	5.4	34.60	20.27
6.3	60.41	24.39	6.3	58.72	51.72	6.4	44.69	17.73	6.4	15.89	31.46	6.4	34.59	20.51
7.3	60.28	24.52	7.3	58.21	51.85	7.4	44.58	17.92	7.4	15.79	31.76	7.4	34.57	20.76
8.3	60.16	24.64	8.3	57.68	51.98	8.3	44.47	18.11	8.4	15.69	32.05	8.4	34.55	21.01
9.3	60.04	24.76	9.3	57.16	52.09	9.3	44.34	18.30	9.4	15.56	32.32	9.4	34.53	21.25
10.3	59.91	24.90	10.3	56.62	52.18	10.3	44.23	18.51	10.4	15.44	32.57	10.4	34.51	21.52
11.3	59.77	25.03	11.3	56.10	52.26	11.3	44.11	18.73	11.4	15.32	32.81	11.4	34.50	21.79
12.3	59.63	25.16	12.3	55.59	52.32	12.3	43.98	18.95	12.4	15.21	33.01	12.4	34.47	22.07
13.3	59.48	25.29	13.3	55.11	52.38	13.3	43.84	19.17	13.4	15.10	33.22	13.4	34.44	22.35
14.3	59.31	25.42	14.3	54.63	52.44	14.3	43.70	19.37	14.4	14.98	33.42	14.4	34.40	22.65
15.3	59.14	25.53	15.3	54.16	52.49	15.3	43.53	19.58	15.4	14.87	33.62	15.4	34.36	22.93
16.3	58.96	25.62	16.3	53.71	52.56	16.3	43.35	19.76	16.4	14.76	33.84	16.4	34.31	23.20
17.3	58.78	25.68	17.3	53.24	52.65	17.3	43.17	19.90	17.4	14.65	34.06	17.4	34.24	23.44
18.3	58.63	25.73	18.3	52.74	52.73	18.3	43.00	20.04	18.4	14.53	34.29	18.4	34.17	23.67
19.3	58.47	25.76	19.3	52.22	52.82	19.3	42.85	20.15	19.4	14.41	34.54	19.4	34.12	23.88
20.3	58.32	25.80	20.3	51.66	52.91	20.3	42.69	20.26	20.4	14.28	34.79	20.4	34.06	24.07
21.3	58.18	25.84	21.3	51.07	52.97	21.3	42.55	20.37	21.4	14.14	35.04	21.4	34.01	24.26
22.3	58.05	25.89	22.3	50.48	53.03	22.3	42.42	20.50	22.4	14.00	35.29	22.4	33.97	24.49
23.3	57.93	25.96	23.3	49.88	53.05	23.3	42.30	20.65	23.4	13.84	35.49	23.4	33.93	24.71
24.3	57.79	26.04	24.3	49.32	53.05	24.3	42.17	20.82	24.4	13.70	35.68	24.4	33.90	24.95
25.3	57.64	26.13	25.3	48.76	53.04	25.3	42.02	20.99	25.4	13.55	35.83	25.4	33.86	25.19
26.3	57.48	26.19	26.3	48.24	53.00	26.3	41.85	21.15	26.4	13.41	35.98	26.4	33.81	25.46
27.2	57.30	26.26	27.3	47.73	52.99	27.3	41.67	21.30	27.4	13.27	36.13	27.4	33.75	25.71
28.2	57.11	26.30	28.3	47.25	52.98	28.3	41.48	21.44	28.4	13.14	36.27	28.4	33.66	25.96
29.2	56.92	26.30	29.3	46.77	52.98	29.3	41.28	21.54	29.4	13.00	36.44	29.4	33.57	26.19
30.2	56.74	26.29	30.3	46.27	52.99	30.3	41.08	21.63	30.3	12.87	36.61	30.4	33.48	26.40
31.2	56.56	26.26	31.3	45.74	53.00	31.3	40.88	21.70	31.3	12.73	36.80	31.4	33.39	26.59
32.2	56.39	26.22	32.3	45.20	53.02	32.3	40.68	21.76	32.3	12.59	36.98	32.4	33.30	26.76
	8.58	−8.52		23.37	+23.35		9.90	−9.85		7.35	+7.28		6.25	−6.17
$14^h\ 13^m\ 46^s.350$			$15^h\ 3^m\ 2^s.510$			$15^h\ 24^m\ 23^s.351$			$16^h\ 54^m\ 12^s.991$			$17^h\ 16^m\ 17^s.234$		
−83° 17′ 54″.52			+87° 32′ 42″.66			−84° 11′ 55″.43			+82° 10′ 21″.42			−80° 47′ 14″.27		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	17 58	+86 36	July	18 8	−87 39	July	19 0	+89 1	July	19 33	−89 12	July	20 48	+82 14
	s	″		s	″		s	″		s	″		s	″
1.5	29.17	58.90	1.5	25.41	47.95	1.5	39.96	19.31	1.5	34.42	57.48	1.6	38.68	0.28
2.5	29.07	59.21	2.5	25.40	48.27	2.5	39.91	19.63	2.5	34.94	57.78	2.6	38.74	0.57
3.5	28.96	59.53	3.5	25.37	48.56	3.5	39.87	19.96	3.5	35.37	58.07	3.6	38.83	0.88
4.5	28.85	59.85	4.5	25.34	48.85	4.5	39.83	20.30	4.5	35.78	58.34	4.6	38.89	1.21
5.5	28.72	60.18	5.5	25.31	49.12	5.5	39.74	20.67	5.5	36.18	58.59	5.6	38.97	1.54
6.5	28.58	60.53	6.5	25.29	49.39	6.5	39.58	21.03	6.5	36.58	58.84	6.6	39.05	1.90
7.5	28.41	60.87	7.5	25.28	49.66	7.5	39.38	21.38	7.5	37.02	59.09	7.6	39.11	2.26
8.5	28.23	61.20	8.5	25.27	49.94	8.5	39.11	21.74	8.5	37.48	59.35	8.6	39.17	2.62
9.5	28.05	61.52	9.5	25.28	50.22	9.5	38.77	22.08	9.5	37.98	59.62	9.6	39.22	2.99
10.4	27.85	61.83	10.5	25.29	50.51	10.5	38.39	22.42	10.5	38.50	59.89	10.6	39.27	3.35
11.4	27.65	62.12	11.5	25.30	50.82	11.5	37.95	22.76	11.5	39.03	60.20	11.6	39.30	3.71
12.4	27.43	62.42	12.5	25.29	51.13	12.5	37.48	23.08	12.5	39.55	60.52	12.6	39.33	4.06
13.4	27.21	62.69	13.4	25.25	51.46	13.5	37.02	23.37	13.5	40.03	60.85	13.6	39.36	4.40
14.4	27.01	62.93	14.4	25.20	51.79	14.5	36.58	23.67	14.5	40.42	61.17	14.6	39.39	4.74
15.4	26.82	63.19	15.4	25.10	52.11	15.5	36.16	23.96	15.5	40.73	61.49	15.6	39.40	5.06
16.4	26.63	63.45	16.4	24.97	52.43	16.5	35.78	24.25	16.5	40.91	61.79	16.6	39.43	5.38
17.4	26.44	63.72	17.4	24.80	52.71	17.5	35.43	24.56	17.5	41.00	62.10	17.5	39.46	5.71
18.4	26.24	64.01	18.4	24.63	52.98	18.5	35.08	24.88	18.5	41.02	62.39	18.5	39.50	6.05
19.4	26.04	64.32	19.4	24.47	53.24	19.5	34.70	25.21	19.5	41.02	62.68	19.5	39.55	6.42
20.4	25.82	64.64	20.4	24.32	53.48	20.5	34.26	25.58	20.5	41.04	62.95	20.5	39.59	6.79
21.4	25.57	64.96	21.4	24.21	53.73	21.5	33.72	25.95	21.5	41.11	63.21	21.5	39.61	7.17
22.4	25.30	65.28	22.4	24.11	53.97	22.5	33.09	26.31	22.5	41.28	63.47	22.5	39.62	7.59
23.4	25.01	65.56	23.4	24.03	54.24	23.5	32.37	26.65	23.5	41.51	63.74	23.5	39.63	7.99
24.4	24.71	65.81	24.4	23.95	54.53	24.5	31.59	26.98	24.5	41.76	64.02	24.5	39.63	8.38
25.4	24.41	66.05	25.4	23.85	54.82	25.5	30.81	27.27	25.5	41.99	64.34	25.5	39.63	8.75
26.4	24.12	66.27	26.4	23.71	55.12	26.4	30.05	27.55	26.5	42.14	64.67	26.5	39.62	9.09
27.4	23.84	66.47	27.4	23.53	55.42	27.4	29.33	27.81	27.5	42.18	65.00	27.5	39.60	9.44
28.4	23.59	66.69	28.4	23.30	55.72	28.4	28.66	28.07	28.5	42.10	65.34	28.5	39.59	9.76
29.4	23.34	66.92	29.4	23.06	56.00	29.4	28.03	28.34	29.5	41.90	65.67	29.5	39.59	10.09
30.4	23.07	67.16	30.4	22.78	56.28	30.4	27.42	28.64	30.5	41.61	65.98	30.5	39.59	10.43
31.4	22.81	67.43	31.4	22.50	56.52	31.4	26.82	28.95	31.5	41.25	66.28	31.5	39.59	10.77
32.4	22.55	67.69	32.4	22.22	56.76	32.4	26.19	29.26	32.5	40.88	66.57	32.5	39.59	11.14
	16.95	+16.92		24.54	−24.52		58.67	+58.66		73.18	−73.18		7.40	+7.33
	$17^h\ 58^m\ 22^s.311$			$18^h\ 7^m\ 23^s.343$			$19^h\ 0^m\ 15^s.079$			$19^h\ 30^m\ 50^s.769$			$20^h\ 48^m\ 32^s.146$	
		+86° 36′ 51″.04			−87° 39′ 50″.89			+89° 1′ 12″.80			−89° 13′ 13″.35			+82° 13′ 56″.82

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			**υ Octantis.** Mag. 5.7			**β Octantis.** Mag. 4.3			**39 H. Cephei.** Mag. 5.6			**γ^1 Octantis.** Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	21 38	−83 5	July	22 16	−86 22	July	22 37	−81 47	July	23 27	+86 51	July	23 47	−82 27
	s	″		s	″		s	″		s	″		s	″
1.6	52.01	3.49	1.7	50.93	17.22	1.7	59.38	50.01	1.7	56.16	36.02	1.7	26.35	31.82
2.6	52.15	3.69	2.6	51.23	17.37	2.7	59.53	50.12	2.7	56.50	36.16	2.7	26.52	31.86
3.6	52.28	3.88	3.6	51.51	17.53	3.7	59.66	50.22	3.7	56.87	36.31	3.7	26.66	31.90
4.6	52.41	4.06	4.6	51.77	17.67	4.7	59.78	50.32	4.7	57.25	36.46	4.7	26.82	31.93
5.6	52.53	4.23	5.6	52.01	17.82	5.7	59.91	50.43	5.7	57.63	36.64	5.7	26.96	31.97
6.6	52.65	4.40	6.6	52.27	17.96	6.7	60.03	50.54	6.7	58.02	36.82	6.7	27.10	32.00
7.6	52.77	4.56	7.6	52.53	18.09	7.7	60.15	50.64	7.7	58.41	37.02	7.7	27.25	32.02
8.6	52.90	4.72	8.6	52.80	18.22	8.6	60.28	50.73	8.7	58.78	37.25	8.7	27.40	32.04
9.6	53.04	4.88	9.6	53.07	18.35	9.6	60.42	50.82	9.7	59.14	37.48	9.7	27.57	32.05
10.6	53.18	5.04	10.6	53.36	18.48	10.6	60.56	50.91	10.7	59.48	37.71	10.7	27.73	32.06
11.6	53.32	5.21	11.6	53.65	18.62	11.6	60.70	51.01	11.7	59.81	37.95	11.7	27.90	32.08
12.6	53.47	5.39	12.6	53.95	18.76	12.6	60.85	51.14	12.7	60.12	38.19	12.7	28.07	32.10
13.6	53.62	5.59	13.6	54.25	18.93	13.6	61.00	51.26	13.7	60.41	38.43	13.7	28.25	32.13
14.6	53.77	5.82	14.6	54.54	19.11	14.6	61.14	51.40	14.7	60.68	38.66	14.7	28.43	32.19
15.6	53.90	6.04	15.6	54.83	19.31	15.6	61.28	51.58	15.7	60.96	38.87	15.7	28.59	32.27
16.6	54.01	6.28	16.6	55.10	19.54	16.6	61.41	51.76	16.7	61.25	39.09	16.7	28.76	32.35
17.6	54.11	6.53	17.6	55.83	19.77	17.6	61.53	51.95	17.7	61.56	39.30	17.7	28.90	32.46
18.6	54.21	6.77	18.6	55.53	19.97	18.6	61.63	52.14	18.7	61.88	39.51	18.7	29.05	32.58
19.6	54.30	7.00	19.6	55.73	20.17	19.6	61.73	52.32	19.7	62.21	39.74	19.7	29.18	32.69
20.6	54.39	7.20	20.6	55.92	20.36	20.6	61.83	52.47	20.6	62.56	39.98	20.7	29.31	32.79
21.6	54.47	7.40	21.6	56.13	20.54	21.6	61.93	52.62	21.6	62.91	40.25	21.7	29.44	32.88
22.6	54.57	7.59	22.6	56.35	20.71	22.6	62.03	52.77	22.6	63.25	40.54	22.7	29.58	32.96
23.6	54.68	7.77	23.6	56.59	20.87	23.6	62.16	52.91	23.6	63.55	40.85	23.7	29.72	33.01
24.6	54.81	7.97	24.6	56.83	21.06	24.6	62.29	53.05	24.6	63.82	41.17	24.7	29.88	33.08
25.6	54.93	8.20	25.6	57.08	21.26	25.6	62.42	53.22	25.6	64.06	41.48	25.6	30.05	33.17
26.6	55.04	8.46	26.6	57.34	21.49	26.6	62.55	53.40	26.6	64.30	41.79	26.6	30.22	33.27
27.6	55.15	8.72	27.6	57.59	21.73	27.6	62.68	53.61	27.6	64.52	42.08	27.6	30.37	33.39
28.6	55.25	9.00	28.6	57.82	21.99	28.6	62.78	53.84	28.6	64.73	42.35	28.6	30.52	33.53
29.5	55.33	9.29	29.6	58.01	22.26	29.6	62.88	54.08	29.6	64.97	42.62	29.6	30.67	33.71
30.5	55.39	9.58	30.6	58.19	22.54	30.6	62.97	54.33	30.6	65.23	42.89	30.6	30.81	33.89
31.5	55.45	9.86	31.6	58.34	22.80	31.6	63.06	54.58	31.6	65.49	43.16	31.6	30.93	34.08
32.5	55.50	10.13	32.6	58.48	23.06	32.6	63.13	54.81	32.6	65.77	43.43	32.6	31.05	34.27
8.31 −8.24			15.80 −15.77			7.01 −6.94			18.26 +18.23			7.62 −7.55		
21^{h} 38^{m} $38^{s}.548$			22^{h} 16^{m} $33^{s}.212$			22^{h} 37^{m} $51^{s}.624$			23^{h} 27^{m} $43^{s}.571$			23^{h} 47^{m} $23^{s}.637$		
−83° 5′ 34″.33			−86° 22′ 50″.92			−81° 48′ 24″.80			+86° 51′ 38″.62			−82° 28′ 8″.42		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h. m	° ′		h m	° ′
Aug.	0 57	+85 49	Aug.	1 32	+88 52	Aug.	1 41	−85 10	Aug.	4 10	+85 20	Aug.	5 35	+85 9
	s	″		s	″		s	″		s	″		s	″
0.7	42.20	22.49	0.7	7.59	16.22	0.7	51.02	10.93	0.8	48.15	15.95	0.9	56.02	19.08
1.7	42.49	22.66	1.7	8.71	16.34	1.7	51.26	11.00	1.8	48.42	15.84	1.9	56.23	18.86
2.7	42.79	22.85	2.7	9.88	16.48	2.7	51.48	11.06	2.8	48.71	15.72	2.9	56.46	18.63
3.7	43.09	23.05	3.7	11.05	16.63	3.7	51.71	11.12	3.8	49.03	15.62	3.9	56.71	18.41
4.7	43.39	23.27	4.7	12.22	16.80	4.7	51.93	11.17	4.8	49.34	15.54	4.9	56.96	18.21
5.7	43.68	23.50	5.7	13.38	16.98	5.7	52.15	11.21	5.8	49.66	15.48	5.9	57.23	18.02
6.7	43.96	23.75	6.7	14.51	17.18	6.7	52.38	11.25	6.8	49.98	15.42	6.9	57.50	17.84
7.7	44.24	24.01	7.7	15.59	17.41	7.7	52.62	11.28	7.8	50.30	15.39	7.9	57.78	17.68
8.7	44.48	24.27	8.7	16.62	17.63	8.7	52.87	11.31	8.8	50.61	15.38	8.9	58.06	17.53
9.7	44.73	24.54	9.7	17.61	17.83	9.7	53.12	11.35	9.8	50.92	15.37	9.8	58.34	17.38
10.7	44.96	24.81	10.7	18.55	18.04	10.7	53.38	11.40	10.8	51.21	15.36	10.8	58.59	17.26
11.7	45.18	25.06	11.7	19.45	18.25	11.7	53.65	11.48	11.8	51.50	15.36	11.8	58.84	17.14
12.6	45.40	25.30	12.7	20.35	18.45	12.7	53.89	11.58	12.8	51.77	15.36	12.8	59.08	17.01
13.6	45.62	25.53	13.7	21.27	18.63	13.7	54.14	11.70	13.8	52.04	15.32	13.8	59.32	16.87
14.6	45.85	25.76	14.7	22.25	18.82	14.7	54.37	11.83	14.8	52.32	15.29	14.8	59.56	16.71
15.6	46.10	25.99	15.7	23.29	19.00	15.7	54.59	11.96	15.8	52.61	15.25	15.8	59.81	16.53
16.6	46.37	26.23	16.7	24.39	19.22	16.7	54.79	12.10	16.8	52.93	15.21	16.8	60.08	16.36
17.6	46.65	26.51	17.7	25.51	19.44	17.7	54.99	12.23	17.8	53.26	15.17	17.8	60.36	16.18
18.6	46.93	26.80	18.7	26.63	19.66	18.7	55.18	12.33	18.8	53.59	15.16	18.8	60.66	16.03
19.6	47.20	27.11	19.7	27.72	19.92	19.7	55.37	12.44	19.8	53.96	15.17	19.8	60.98	15.89
20.6	47.45	27.44	20.7	28.73	20.20	20.7	55.59	12.54	20.8	54.30	15.21	20.8	61.30	15.79
21.6	47.64	27.76	21.6	29.68	20.48	21.7	55.82	12.63	21.8	54.63	15.26	21.8	61.61	15.71
22.6	47.84	28.09	22.6	30.54	20.76	22.7	56.06	12.73	22.8	54.95	15.32	22.8	61.89	15.63
23.6	48.04	28.40	23.6	31.34	21.04	23.6	56.29	12.86	23.8	55.24	15.39	23.8	62.20	15.57
24.6	48.22	28.70	24.6	32.13	21.30	24.6	56.53	13.01	24.8	55.53	15.45	24.8	62.48	15.49
25.6	48.39	28.99	25.6	32.92	21.55	25.6	56.77	13.19	25.7	55.81	15.50	25.8	62.74	15.41
26.6	48.58	29.27	26.6	33.74	21.79	26.6	56.99	13.38	26.7	56.08	15.51	26.8	63.00	15.32
27.6	48.77	29.54	27.6	34.60	22.03	27.6	57.19	13.59	27.7	56.37	15.53	27.8	63.26	15.22
28.6	48.98	29.82	28.6	35.51	22.27	28.6	57.38	13.79	28.7	56.67	15.56	28.8	63.52	15.11
29.6	49.20	30.11	29.6	36.44	22.52	29.6	57.56	14.01	29.7	56.98	15.59	29.8	63.78	15.00
30.6	49.43	30.42	30.6	37.37	22.79	30.6	57.74	14.23	30.7	57.29	15.61	30.8	64.10	14.88
31.6	49.64	30.73	31.6	38.31	23.05	31.6	57.91	14.42	31.7	57.62	15.64	31.8	64.40	14.77
	13.73	+13.70		50.80	+50.79		11.88	−11.83		12.30	+12.26		11.84	+11.80
$0^h\ 57^m\ 24^s.633$			$1^h\ 31^m\ 11^s.709$			$1^h\ 41^m\ 54^s.846$			$4^h\ 10^m\ 37^s.831$			$5^h\ 35^m\ 50^s.330$		
+85° 49′ 24″.14			+88° 52′ 20″.55			−85° 10′ 45″.22			+85° 20′ 28″.88			+85° 9′ 34″.51		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			**ζ Mensæ.** Mag. 5.6			**51 H. Cephei.** Mag. 5.3			**25 H. Camelop.** Mag. 5.1			**7 G. Octantis.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	5 45	−84 49	Aug.	6 46	−80 43	Aug.	7 3	+87 10	Aug.	7 14	+82 33	Aug.	7 14	−86 54
	s	″		s	″		s	″		s	″		s	″
0.9	29.31	34.64	0.9	37.08	45.38	0.9	1.79	27.93	0.9	8.99	61.97	0.9	59.71	23.79
1.9	29.47	34.40	1.9	37.14	45.11	1.9	2.01	27.62	1.9	9.07	61.65	1.9	59.84	23.51
2.9	29.62	34.18	2.9	37.19	44.85	2.9	2.25	27.31	2.9	9.16	61.34	2.9	59.97	23.24
3.9	29.76	33.96	3.9	37.26	44.58	3.9	2.53	26.99	3.9	9.25	61.03	3.9	60.10	22.98
4.9	29.90	33.76	4.9	37.31	44.32	4.9	2.82	26.68	4.9	9.36	60.72	4.9	60.20	22.72
5.9	30.04	33.54	5.9	37.37	44.05	5.9	3.13	26.37	5.9	9.49	60.41	5.9	60.31	22.45
6.9	30.18	33.31	6.9	37.42	43.77	6.9	3.46	26.08	6.9	9.61	60.12	6.9	60.42	22.18
7.9	30.32	33.08	7.9	37.48	43.49	7.9	3.81	25.79	7.9	9.75	59.84	7.9	60.52	21.89
8.9	30.47	32.83	8.9	37.55	43.20	8.9	4.17	25.52	8.9	9.88	59.57	8.9	60.63	21.60
9.9	30.62	32.58	9.9	37.61	42.90	9.9	4.53	25.28	9.9	10.02	59.33	9.9	60.76	21.29
10.9	30.80	32.33	10.9	37.67	42.60	10.9	4.87	25.05	10.9	10.15	59.08	10.9	60.89	20.97
11.9	30.98	32.07	11.9	37.76	42.30	11.9	5.20	24.81	11.9	10.27	58.85	11.9	61.05	20.66
12.8	31.16	31.83	12.9	37.83	42.01	12.9	5.51	24.57	12.9	10.38	58.62	12.9	61.24	20.34
13.8	31.35	31.62	13.9	37.91	41.73	13.9	5.80	24.33	13.9	10.49	58.37	13.9	61.43	20.06
14.8	31.55	31.43	14.9	38.00	41.48	14.9	6.10	24.07	14.9	10.59	58.11	14.9	61.66	19.78
15.8	31.75	31.27	15.9	38.09	41.24	15.9	6.41	23.79	15.9	10.70	57.82	15.9	61.90	19.54
16.8	31.94	31.12	16.9	38.18	41.02	16.9	6.73	23.51	16.9	10.83	57.54	16.9	62.12	19.31
17.8	32.12	30.99	17.9	38.27	40.82	17.9	7.10	23.22	17.9	10.97	57.25	17.9	62.31	19.10
18.8	32.28	30.83	18.9	38.35	40.62	18.9	7.50	22.93	18.9	11.12	56.94	18.9	62.51	18.89
19.8	32.45	30.66	19.9	38.43	40.40	19.9	7.92	22.66	19.9	11.29	56.66	19.9	62.69	18.66
20.8	32.63	30.49	20.9	38.51	40.17	20.9	8.37	22.42	20.9	11.46	56.41	20.9	62.86	18.41
21.8	32.81	30.31	21.9	38.59	39.93	21.9	8.82	22.18	21.9	11.63	56.17	21.9	63.04	18.14
22.8	32.99	30.10	22.9	38.68	39.67	22.9	9.25	21.97	22.9	11.80	55.96	22.9	63.24	17.88
23.8	33.19	29.90	23.9	38.76	39.40	23.9	9.66	21.78	23.9	11.95	55.77	23.9	63.46	17.58
24.8	33.41	29.70	24.9	38.86	39.15	24.9	10.04	21.59	24.9	12.09	55.57	24.9	63.70	17.31
25.8	33.64	29.54	25.9	38.97	38.91	25.9	10.41	21.40	25.9	12.23	55.37	25.9	63.97	17.03
26.8	33.87	29.40	26.9	39.08	38.69	26.9	10.78	21.20	26.9	12.36	55.15	26.9	64.26	16.78
27.8	34.10	29.28	27.8	39.19	38.48	27.9	11.13	20.98	27.9	12.48	54.93	27.9	64.56	16.55
28.8	34.33	29.17	28.8	39.30	38.30	28.9	11.49	20.74	28.9	12.62	54.68	28.9	64.86	16.34
29.8	34.55	29.07	29.8	39.41	38.13	29.9	11.87	20.49	29.9	12.77	54.44	29.9	65.16	16.14
30.8	34.76	28.98	30.8	39.53	37.98	30.9	12.29	20.25	30.9	12.92	54.19	30.9	65.46	15.95
31.8	34.98	28.90	31.8	39.64	37.83	31.8	12.71	20.02	31.9	13.07	53.95	31.9	65.75	15.77
	11.09	−11.04		6.21	−6.13		20.28	+20.25		7.73	+7.66		18.52	−18.50
$5^h\ 45^m\ 51^s.396$			$6^h\ 46^m\ 48^s.653$			$7^h\ 3^m\ 2^s.335$			$7^h\ 14^m\ 7^s.912$			$7^h\ 15^m\ 39^s.691$		
$-84^\circ\ 49'\ 44''.27$			$-80^\circ\ 43'\ 46''.14$			$+87^\circ\ 10'\ 43''.86$			$+82^\circ\ 34'\ 17''.32$			$-86^\circ\ 54'\ 19''.75$		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	8 17	+88 52	Aug.	9 8	−85 20	Aug.	9 25	+81 40	Aug.	9 36	−80 34	Aug.	10 21	+82 57
	s	″		s	″		s	″		s	″		s	″
0.9	24.98	23.33	1.0	20.97	46.51	1.0	36.77	59.03	1.0	11.32	61.82	1.1	15.13	69.54
1.9	25.16	22.99	2.0	20.94	46.23	2.0	36.75	58.69	2.0	11.30	61.54	2.1	15.06	69.22
2.9	25.39	22.62	3.0	20.91	45.96	3.0	36.73	58.35	3.0	11.27	61.25	3.1	15.00	68.89
3.9	25.69	22.26	4.0	20.89	45.68	4.0	36.72	57.98	4.0	11.26	60.98	4.1	14.94	68.55
4.9	26.03	21.89	5.0	20.85	45.40	5.0	36.73	57.61	5.0	11.24	60.71	5.1	14.89	68.19
5.9	26.44	21.53	6.0	20.82	45.13	6.0	36.74	57.24	6.0	11.21	60.43	6.1	14.85	67.83
6.9	26.90	21.19	7.0	20.78	44.85	7.0	36.77	56.88	7.0	11.18	60.15	7.1	14.82	67.46
7.9	27.40	20.85	8.0	20.74	44.55	8.0	36.80	56.54	8.0	11.15	59.87	8.1	14.81	67.10
8.9	27.95	20.51	8.9	20.70	44.25	9.0	36.84	56.19	9.0	11.11	59.57	9.1	14.80	66.75
9.9	28.49	20.19	9.9	20.66	43.94	10.0	36.88	55.86	10.0	11.08	59.26	10.0	14.80	66.42
10.9	29.03	19.88	10.9	20.61	43.61	11.0	36.91	55.52	11.0	11.06	58.93	11.0	14.79	66.09
11.9	29.55	19.57	11.9	20.59	43.28	12.0	36.93	55.20	12.0	11.03	58.60	12.0	14.78	65.77
12.9	30.03	19.28	12.9	20.59	42.93	13.0	36.95	54.89	13.0	11.02	58.24	13.0	14.77	65.46
13.9	30.46	18.97	13.9	20.59	42.59	13.9	36.97	54.57	14.0	11.01	57.91	14.0	14.74	65.14
14.9	30.87	18.65	14.9	20.63	42.26	14.9	36.98	54.24	15.0	11.01	57.58	15.0	14.70	64.82
15.9	31.27	18.31	15.9	20.67	41.96	15.9	37.00	53.91	16.0	11.01	57.28	16.0	14.66	64.47
16.9	31.73	17.96	16.9	20.71	41.67	16.9	37.01	53.54	16.9	11.02	56.99	17.0	14.63	64.10
17.9	32.26	17.60	17.9	20.75	41.40	17.9	37.05	53.18	17.9	11.04	56.70	18.0	14.62	63.73
18.9	32.88	17.24	18.9	20.78	41.13	18.9	37.08	52.78	18.9	11.05	56.44	19.0	14.61	63.33
19.9	33.59	16.89	19.9	20.80	40.87	19.9	37.13	52.39	19.9	11.05	56.18	20.0	14.61	62.94
20.9	34.36	16.53	20.9	20.81	40.58	20.9	37.19	52.02	20.9	11.04	55.90	21.0	14.64	62.54
21.9	35.15	16.21	21.9	20.82	40.29	21.9	37.26	51.65	21.9	11.04	55.60	22.0	14.68	62.15
22.9	35.94	15.92	22.9	20.83	39.97	22.9	37.33	51.31	22.9	11.04	55.28	23.0	14.72	61.80
23.9	36.70	15.63	23.9	20.86	39.64	23.9	37.40	50.99	23.9	11.04	54.94	24.0	14.75	61.47
24.9	37.40	15.35	24.9	20.89	39.30	24.9	37.47	50.69	24.9	11.04	54.60	25.0	14.76	61.14
25.9	38.05	15.07	25.9	20.95	38.96	25.9	37.51	50.38	25.9	11.05	54.25	26.0	14.77	60.80
26.9	38.66	14.79	26.9	21.03	38.64	26.9	37.56	50.06	26.9	11.08	53.90	27.0	14.78	60.46
27.9	39.26	14.51	27.9	21.12	38.32	27.9	37.60	49.74	27.9	11.11	53.59	27.9	14.78	60.13
28.9	39.87	14.21	28.9	21.22	38.03	28.9	37.64	49.39	28.9	11.15	53.27	28.9	14.78	59.78
29.9	40.52	13.88	29.9	21.32	37.73	29.9	37.68	49.03	29.9	11.19	52.99	29.9	14.79	59.41
30.9	41.22	13.54	30.9	21.42	37.45	30.9	37.73	48.67	30.9	11.23	52.69	30.9	14.80	59.03
31.9	41.97	13.22	31.9	21.52	37.17	31.9	37.79	48.31	31.9	11.27	52.40	31.9	14.81	58.66
50.79 +50.78			12.32 −12.28			6.91 +6.84			6.11 −6.03			8.17 +8.11		
$8^h\ 17^m\ 47^s.546$			$9^h\ 8^m\ 41^s.594$			$9^h\ 25^m\ 39^s.275$			$9^h\ 36^m\ 19^s.026$			$10^h\ 21^m\ 19^s.949$		
+88° 52′ 37″.80			−85° 20′ 26″.78			+81° 41′ 10″.13			−80° 34′ 39″.26			+82° 58′ 17″.67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. **Mag. 6.3**			**Bradley 1672.** **Mag. 6.3**			**ι Octantis.** **Mag. 5.4**			**32 H. Camelop. *seq.*** **Mag. 5.3**			**κ Octantis.** **Mag. 5.6**		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	10 59	−84 9	Aug.	12 13	+88 8	Aug.	12 46	−84 41	Aug.	12 48	+83 51	Aug.	13 27	−85 22
	s	″		s	″		s	″		s	″		s	″
1.1	46.98	59.89	1.1	58.16	55.28	1.2	21.80	35.90	1.2	23.93	13.08	1.2	40.65	53.38
2.1	46.88	59.64	2.1	57.59	55.06	2.2	21.62	35.75	2.2	23.74	12.91	2.2	40.42	53.29
3.1	46.78	59.41	3.1	57.02	54.82	3.2	21.45	35.62	3.2	23.55	12.72	3.2	40.21	53.19
4.1	46.68	59.17	4.1	56.47	54.55	4.2	21.28	35.48	4.2	23.37	12.52	4.2	40.00	53.10
5.1	46.57	58.95	5.1	55.94	54.28	5.2	21.11	35.36	5.2	23.19	12.29	5.2	39.80	53.02
6.1	46.46	58.73	6.1	55.42	53.99	6.2	20.94	35.25	6.2	23.02	12.06	6.2	39.58	52.96
7.1	46.36	58.51	7.1	54.95	53.69	7.2	20.76	35.13	7.2	22.86	11.82	7.2	39.36	52.89
8.1	46.25	58.28	8.1	54.51	53.39	8.2	20.58	35.00	8.2	22.71	11.55	8.2	39.14	52.82
9.1	46.12	58.04	9.1	54.09	53.09	9.2	20.38	34.87	9.2	22.56	11.29	9.2	38.90	52.74
10.1	46.00	57.80	10.1	53.71	52.80	10.1	20.19	34.75	10.1	22.43	11.02	10.2	38.66	52.66
11.1	45.88	57.52	11.1	53.35	52.52	11.1	19.99	34.59	11.1	22.29	10.78	11.2	38.40	52.56
12.1	45.77	57.24	12.1	52.98	52.25	12.1	19.78	34.41	12.1	22.16	10.55	12.2	38.15	52.43
13.1	45.67	56.95	13.1	52.60	51.99	13.1	19.58	34.22	13.1	22.02	10.32	13.2	37.89	52.30
14.1	45.57	56.64	14.1	52.19	51.73	14.1	19.40	34.00	14.1	21.88	10.10	14.2	37.65	52.13
15.1	45.49	56.33	15.1	51.73	51.46	15.1	19.22	33.78	15.1	21.72	9.88	15.2	37.42	51.95
16.1	45.43	56.04	16.1	51.25	51.17	16.1	19.07	33.58	16.1	21.56	9.65	16.2	37.23	51.78
17.1	45.38	55.76	17.1	50.76	50.86	17.1	18.94	33.38	17.1	21.39	9.39	17.2	37.04	51.63
18.1	45.33	55.51	18.1	50.29	50.54	18.1	18.81	33.18	18.1	21.22	9.11	18.2	36.87	51.48
19.0	45.28	55.27	19.1	49.86	50.18	19.1	18.68	33.00	19.1	21.07	8.81	19.2	36.69	51.33
20.0	45.22	55.03	20.1	49.46	49.82	20.1	18.54	32.85	20.1	20.92	8.49	20.1	36.51	51.21
21.0	45.13	54.78	21.1	49.11	49.46	21.1	18.40	32.68	21.1	20.79	8.17	21.1	36.31	51.09
22.0	45.05	54.51	22.1	48.82	49.12	22.1	18.22	32.50	22.1	20.69	7.85	22.1	36.09	50.97
23.0	44.97	54.23	23.1	48.55	48.77	23.1	18.05	32.32	23.1	20.58	7.52	23.1	35.88	50.83
24.0	44.88	53.91	24.1	48.29	48.44	24.1	17.90	32.10	24.1	20.48	7.23	24.1	35.64	50.66
25.0	44.82	53.58	25.1	48.02	48.11	25.1	17.73	31.86	25.1	20.37	6.95	25.1	35.41	50.47
26.0	44.76	53.25	26.1	47.73	47.82	26.1	17.54	31.61	26.1	20.26	6.67	26.1	35.18	50.25
27.0	44.71	52.91	27.1	47.41	47.53	27.1	17.40	31.34	27.1	20.13	6.40	27.1	34.98	50.03
28.0	44.68	52.58	28.1	47.07	47.21	28.1	17.25	31.06	28.1	20.00	6.13	28.1	34.79	49.79
29.0	44.66	52.26	29.1	46.72	46.90	29.1	17.14	30.79	29.1	19.86	5.85	29.1	34.60	49.56
30.0	44.65	51.97	30.1	46.37	46.57	30.1	17.03	30.52	30.1	19.73	5.56	30.1	34.45	49.32
31.0	44.64	51.67	31.1	46.02	46.23	31.1	16.92	30.26	31.1	19.60	5.25	31.1	34.29	49.09
32.0	44.63	51.37	32.1	45.69	45.86	32.1	16.82	30.02	32.1	19.47	4.92	32.1	34.14	48.87
9.84		−9.79	30.94		+30.92	10.81		−10.77	9.34		+9.28	12.42		−12.38
10^h	59^m	$54^s.546$	12^h	14^m	$29^s.190$	12^h	46^m	$19^s.119$	12^h	48^m	$31^s.308$	13^h	27^m	$32^s.891$
−84°	9′	29″.33	+88°	8′	56″.19	−84°	41′	1″.57	+83°	51′	11″.30	−85°	22′	19″.48

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			**Groombridge 2283.** Mag. 7.2			**ρ Octantis.** Mag. 5.7			**ε Ursæ Minoris.** Mag. 4.4			**59 G. Apodis.** Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	14 13	−83 18	Aug.	15 2	+87 32	Aug.	15 24	−84 12	Aug.	16 54	+82 10	Aug.	17 16	−80 47
	s	″		s	″		s	″		s	″		s	″
1.2	56.39	26.22	1.3	45.20	53.02	1.3	40.68	21.76	1.3	12.59	36.98	1.4	33.30	26.76
2.2	56.24	26.18	2.3	44.64	53.03	2.3	40.50	21.81	2.3	12.44	37.18	2.4	33.22	26.93
3.2	56.09	26.14	3.3	44.07	53.04	3.3	40.34	21.86	3.3	12.29	37.37	3.4	33.13	27.08
4.2	55.93	26.11	4.3	43.50	53.04	4.3	40.17	21.90	4.3	12.14	37.56	4.4	33.06	27.25
5.2	55.79	26.10	5.3	42.90	53.01	5.3	40.01	21.96	5.3	11.97	37.71	5.3	32.98	27.42
6.2	55.65	26.09	6.3	42.33	52.98	6.3	39.84	22.02	6.3	11.80	37.86	6.3	32.91	27.60
7.2	55.49	26.07	7.3	41.76	52.93	7.3	39.67	22.09	7.3	11.63	37.99	7.3	32.83	27.79
8.2	55.34	26.05	8.2	41.19	52.85	8.3	39.50	22.17	8.3	11.46	38.10	8.3	32.75	27.97
9.2	55.17	26.03	9.2	40.66	52.76	9.3	39.31	22.26	9.3	11.31	38.21	9.3	32.67	28.17
10.2	54.99	26.00	10.2	40.14	52.66	10.3	39.12	22.32	10.3	11.15	38.30	10.3	32.59	28.37
11.2	54.81	25.96	11.2	39.62	52.58	11.3	38.92	22.39	11.3	11.00	38.39	11.3	32.50	28.57
12.2	54.63	25.91	12.2	39.12	52.50	12.3	38.71	22.44	12.3	10.85	38.46	12.3	32.39	28.76
13.2	54.45	25.83	13.2	38.62	52.44	13.2	38.49	22.44	13.3	10.70	38.56	13.3	32.28	28.93
14.2	54.26	25.74	14.2	38.12	52.37	14.2	38.27	22.45	14.3	10.54	38.69	14.3	32.15	29.07
15.2	54.10	25.60	15.2	37.58	52.32	15.2	38.06	22.44	15.3	10.38	38.81	15.3	32.04	29.21
16.2	53.95	25.48	16.2	37.03	52.27	16.2	37.87	22.40	16.3	10.21	38.93	16.3	31.93	29.31
17.2	53.80	25.37	17.2	36.43	52.22	17.2	37.70	22.37	17.3	10.04	39.06	17.3	31.84	29.41
18.2	53.67	25.26	18.2	35.83	52.13	18.2	37.54	22.36	18.3	9.86	39.18	18.3	31.75	29.51
19.2	53.55	25.17	19.2	35.22	52.01	19.2	37.39	22.34	19.3	9.67	39.28	19.3	31.66	29.60
20.2	53.41	25.09	20.2	34.64	51.88	20.2	37.21	22.34	20.3	9.48	39.35	20.3	31.58	29.72
21.2	53.27	25.03	21.2	34.07	51.73	21.2	37.04	22.36	21.3	9.30	39.40	21.3	31.49	29.86
22.2	53.12	24.95	22.2	33.54	51.57	22.2	36.85	22.37	22.3	9.12	39.42	22.3	31.39	30.01
23.2	52.94	24.86	23.2	33.02	51.41	23.2	36.66	22.38	23.3	8.95	39.43	23.3	31.29	30.16
24.2	52.77	24.74	24.2	32.55	51.26	24.2	36.45	22.37	24.3	8.78	39.44	24.3	31.18	30.30
25.2	52.60	24.61	25.2	32.06	51.12	25.2	36.23	22.33	25.3	8.62	39.48	25.3	31.05	30.41
26.2	52.43	24.45	26.2	31.58	50.99	26.2	36.00	22.27	26.3	8.47	39.51	26.3	30.91	30.51
27.2	52.26	24.27	27.2	31.08	50.88	27.2	35.79	22.20	27.3	8.29	39.56	27.3	30.78	30.58
28.2	52.11	24.08	28.2	30.57	50.78	28.2	35.59	22.11	28.3	8.12	39.61	28.3	30.64	30.64
29.2	51.96	23.91	29.2	30.04	50.66	29.2	35.39	22.01	29.3	7.94	39.67	29.3	30.52	30.68
30.2	51.83	23.72	30.2	29.49	50.53	30.2	35.19	21.90	30.3	7.77	39.73	30.3	30.39	30.72
31.2	51.69	23.54	31.2	28.94	50.39	31.2	35.01	21.80	31.3	7.60	39.78	31.3	30.28	30.76
32.1	51.56	23.35	32.2	28.39	50.24	32.2	34.84	21.71	32.3	7.41	39.83	32.3	30.17	30.80
	8.58	−8.52		23.37	+23.35		9.91	−9.86		7.35	+7.28		6.25	−6.17
$14^{h}\ 13^{m}\ 46^{s}.350$			$15^{h}\ 3^{m}\ 2^{s}.510$			$15^{h}\ 24^{m}\ 23^{s}.351$			$16^{h}\ 54^{m}\ 12^{s}.991$			$17^{h}\ 16^{m}\ 17^{s}.234$		
−83° 17′ 54″.52			+87° 32′ 42″.66			−84° 11′ 55″.43			+82° 10′ 21″.42			−80° 47′ 14″.27		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			**χ Octantis.** Mag. 5.2			**λ Ursæ Minoris.** Mag. 6.6			**σ Octantis.** Mag. 5.5			**76 Draconis.** Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	17 58	+86 37	Aug.	18 8	−87 39	Aug.	18 59	+89 1	Aug.	19 33	−89 13	Aug.	20 48	+82 14
	s	″		s	″		s	″		s	″		s	″
1.4	22.55	7.69	1.4	22.22	56.76	1.4	86.19	29.26	1.5	40.88	6.57	1.5	39.59	11.14
2.4	22.27	7.96	2.4	21.94	56.99	2.4	85.51	29.58	2.5	40.51	6.84	2.5	39.59	11.52
3.4	21.98	8.22	3.4	21.67	57.21	3.4	84.78	29.90	3.4	40.17	7.10	3.5	39.60	11.90
4.4	21.66	8.47	4.4	21.42	57.43	4.4	83.97	30.22	4.4	39.84	7.36	4.5	39.59	12.29
5.4	21.34	8.71	5.4	21.18	57.65	5.4	83.11	30.53	5.4	39.56	7.62	5.5	39.56	12.67
6.4	21.01	8.93	6.4	20.94	57.88	6.4	82.20	30.82	6.4	39.30	7.88	6.5	39.53	13.06
7.4	20.67	9.14	7.4	20.70	58.12	7.4	81.24	31.11	7.4	39.05	8.16	7.5	39.51	13.44
8.4	20.32	9.34	8.4	20.46	58.37	8.4	80.26	31.39	8.4	38.79	8.47	8.5	39.47	13.82
9.4	19.97	9.54	9.4	20.19	58.64	9.4	79.26	31.64	9.4	38.52	8.78	9.5	39.42	14.16
10.4	19.63	9.72	10.4	19.91	58.91	10.4	78.26	31.88	10.4	38.17	9.10	10.5	39.38	14.50
11.4	19.29	9.88	11.4	19.59	59.17	11.4	77.31	32.13	11.4	37.74	9.41	11.5	39.33	14.83
12.4	18.97	10.05	12.4	19.24	59.42	12.4	76.37	32.37	12.4	37.21	9.73	12.5	39.28	15.16
13.4	18.66	10.22	13.4	18.86	59.66	13.4	75.51	32.61	13.4	36.57	10.02	13.5	39.24	15.49
14.4	18.34	10.41	14.4	18.47	59.86	14.4	74.65	32.88	14.4	35.83	10.31	14.5	39.20	15.83
15.4	18.02	10.61	15.4	18.07	60.04	15.4	73.78	33.15	15.4	35.07	10.56	15.5	39.17	16.19
16.3	17.69	10.83	16.4	17.68	60.22	16.4	72.86	33.43	16.4	34.30	10.81	16.5	39.14	16.57
17.3	17.32	11.05	17.4	17.32	60.37	17.4	71.87	33.72	17.4	33.58	11.04	17.5	39.10	16.95
18.3	16.94	11.25	18.3	16.99	60.54	18.4	70.79	34.01	18.4	32.93	11.25	18.5	39.05	17.35
19.3	16.54	11.46	19.3	16.68	60.71	19.4	69.63	34.31	19.4	32.35	11.49	19.5	39.00	17.74
20.3	16.12	11.65	20.3	16.37	60.90	20.4	68.39	34.56	20.4	31.83	11.75	20.5	38.94	18.11
21.3	15.73	11.80	21.3	16.07	61.10	21.4	67.13	34.81	21.4	31.30	12.02	21.5	38.85	18.48
22.3	15.34	11.94	22.3	15.74	61.30	22.4	65.90	35.04	22.4	30.72	12.29	22.4	38.77	18.82
23.3	14.94	12.05	23.3	15.36	61.52	23.4	64.68	35.23	23.4	30.05	12.57	23.4	38.68	19.15
24.3	14.56	12.15	24.3	14.94	61.73	24.4	63.53	35.42	24.4	29.25	12.86	24.4	38.60	19.45
25.3	14.20	12.27	25.3	14.48	61.92	25.4	62.44	35.61	25.4	28.34	13.14	25.4	38.52	19.76
26.3	13.84	12.40	26.3	14.02	62.08	26.4	61.39	35.81	26.4	27.33	13.39	26.4	38.46	20.06
27.3	13.48	12.53	27.3	13.54	62.23	27.4	60.35	36.03	27.4	26.25	13.64	27.4	38.39	20.39
28.3	13.13	12.67	28.3	13.06	62.37	28.4	59.28	36.26	28.4	25.14	13.88	28.4	38.32	20.72
29.3	12.76	12.83	29.3	12.59	62.51	29.4	58.18	36.50	29.4	24.05	14.11	29.4	38.26	21.06
30.3	12.37	12.99	30.3	12.12	62.62	30.4	57.04	36.73	30.4	22.97	14.30	30.4	38.18	21.43
31.3	11.96	13.15	31.3	11.68	62.72	31.3	55.84	36.97	31.4	21.93	14.50	31.4	38.10	21.77
32.3	11.56	13.29	32.3	11.25	62.83	32.3	54.59	37.21	32.4	20.90	14.71	32.4	38.03	22.12
16.96		+16.93	24.56		−24.54	58.82		+58.81	73.42		−73.41	7.40		+7.34
17^{h}	58^{m}	$22^{s}.311$	18^{h}	7^{m}	$23^{s}.343$	19^{h}	0^{m}	$15^{s}.079$	19^{h}	30^{m}	$50^{s}.769$	20^{h}	48^{m}	$32^{s}.146$
+86°	36′	51″.04	−87°	39′	50″.89	+89°	1′	12″.80	−89°	13′	13″.35	+82°	13′	56″.82

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			**υ Octantis. Mag. 5.7**			**β Octantis. Mag. 4.3**			**39 H. Cephei. Mag. 5.6**			**γ^1 Octantis. Mag. 5.1**		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	21 38	−83 5	Aug.	22 16	−86 22	Aug.	22 38	−81 47	Aug.	23 28	+86 51	Aug.	23 47	−82 27
	s	″		s	″		s	″		s	″		s	″
1.5	55.50	10.13	1.6	58.48	23.06	1.6	3.13	54.81	1.6	5.77	43.43	1.6	31.05	34.27
2.5	55.54	10.39	2.6	58.61	23.31	2.6	3.20	55.03	2.6	6.05	43.74	2.6	31.15	34.45
3.5	55.59	10.65	3.6	58.74	23.56	3.6	3.27	55.25	3.6	6.33	44.04	3.6	31.27	34.61
4.5	55.65	10.89	4.6	58.88	23.79	4.6	3.35	55.47	4.6	6.59	44.36	4.6	31.39	34.78
5.5	55.71	11.14	5.6	59.03	24.03	5.6	3.44	55.69	5.6	6.84	44.69	5.6	31.50	34.95
6.5	55.77	11.39	6.6	59.18	24.27	6.6	3.52	55.90	6.6	7.07	45.03	6.6	31.63	35.11
7.5	55.83	11.66	7.6	59.35	24.50	7.6	3.61	56.11	7.6	7.28	45.38	7.6	31.75	35.27
8.5	55.91	11.91	8.5	59.52	24.76	8.6	3.70	56.34	8.6	7.47	45.73	8.6	31.88	35.44
9.5	55.98	12.19	9.5	59.69	25.02	9.6	3.79	56.57	9.6	7.65	46.07	9.6	32.02	35.61
10.5	56.04	12.47	10.5	59.86	25.30	10.6	3.89	56.81	10.6	7.82	46.41	10.6	32.16	35.80
11.5	56.09	12.78	11.5	60.00	25.58	11.6	3.97	57.08	11.6	7.97	46.74	11.6	32.29	36.00
12.5	56.14	13.09	12.5	60.14	25.91	12.6	4.04	57.37	12.6	8.13	47.06	12.6	32.41	36.23
13.5	56.17	13.41	13.5	60.24	26.23	13.5	4.09	57.67	13.6	8.30	47.37	13.6	32.51	36.47
14.5	56.18	13.72	14.5	60.33	26.54	14.5	4.15	57.96	14.6	8.48	47.67	14.6	32.61	36.72
15.5	56.19	14.02	15.5	60.38	26.82	15.5	4.20	58.25	15.6	8.67	47.98	15.6	32.70	36.97
16.5	56.19	14.30	16.5	60.44	27.10	16.5	4.24	58.53	16.6	8.90	48.31	16.6	32.79	37.21
17.5	56.19	14.57	17.5	60.49	27.37	17.5	4.27	58.77	17.6	9.12	48.68	17.6	32.87	37.44
18.5	56.22	14.81	18.5	60.54	27.62	18.5	4.31	59.01	18.6	9.32	49.05	18.6	32.95	37.64
19.5	56.25	15.05	19.5	60.62	27.86	19.5	4.36	59.25	19.6	9.51	49.44	19.6	33.03	37.84
20.5	56.27	15.32	20.5	60.71	28.12	20.5	4.42	59.49	20.6	9.66	49.83	20.6	33.13	38.03
21.5	56.30	15.59	21.5	60.82	28.38	21.5	4.49	59.73	21.6	9.77	50.22	21.6	33.23	38.24
22.5	56.33	15.87	22.5	60.93	28.66	22.5	4.55	60.00	22.6	9.87	50.60	22.6	33.35	38.46
23.5	56.35	16.17	23.5	61.02	28.97	23.5	4.61	60.28	23.6	9.95	50.97	23.6	33.46	38.70
24.5	56.36	16.49	24.5	61.08	29.29	24.5	4.66	60.59	24.6	10.03	51.31	24.6	33.56	38.97
25.5	56.36	16.83	25.5	61.13	29.63	25.5	4.70	60.92	25.6	10.12	51.64	25.6	33.65	39.24
26.5	56.33	17.17	26.5	61.14	29.96	26.5	4.73	61.24	26.5	10.22	51.98	26.6	33.73	39.53
27.5	56.30	17.50	27.5	61.16	30.29	27.5	4.74	61.56	27.5	10.33	52.30	27.6	33.79	39.83
28.5	56.27	17.79	28.5	61.14	30.62	28.5	4.74	61.87	28.5	10.46	52.63	28.6	33.85	40.13
29.5	56.23	18.08	29.5	61.11	30.94	29.5	4.75	62.16	29.5	10.60	53.00	29.6	33.90	40.42
30.5	56.19	18.36	30.5	61.08	31.25	30.5	4.75	62.45	30.5	10.73	53.35	30.6	33.94	40.70
31.5	56.15	18.63	31.5	61.05	31.54	31.5	4.76	62.73	31.5	10.86	53.72	31.5	33.99	40.98
32.5	56.12	18.90	32.5	61.03	31.83	32.5	4.76	63.00	32.5	10.96	54.10	32.5	34.04	41.25
	8.31	−8.25		15.81	−15.78		7.01	−6.94		18.28	+18.25		7.62	−7.56
21^h	38^m	$38^s.548$	22^h	16^m	$33^s.212$	22^h	37^m	$51^s.624$	23^h	27^m	$43^s.571$	23^h	47^m	$23^s.637$
−83°	5′	34″.33	−86°	22′	50″.92	−81°	48′	24″.80	+86°	51′	38″.62	−82°	28′	8″.42

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	0 57	+85 49	Sept.	1 32	+88 52	Sept.	1 41	−85 10	Sept.	4 10	+85 20	Sept.	5 36	+85 9
	s	″		s	″		s	″		s	″		s	″
0.6	49.64	30.73	0.6	38.31	23.05	0.6	57.91	14.42	0.7	57.62	15.64	0.8	4.40	14.77
1.6	49.85	31.06	1.6	39.24	23.33	1.6	58.08	14.62	1.7	57.95	15.70	1.8	4.71	14.69
2.6	50.05	31.40	2.6	40.13	23.64	2.6	58.26	14.81	2.7	58.28	15.79	2.8	5.03	14.62
3.6	50.24	31.75	3.6	40.97	23.96	3.6	58.43	14.99	3.7	58.61	15.88	3.8	5.35	14.56
4.6	50.42	32.11	4.6	41.77	24.28	4.6	58.61	15.18	4.7	58.94	15.98	4.8	5.67	14.52
5.6	50.57	32.47	5.6	42.52	24.61	5.6	58.80	15.37	5.7	59.25	16.11	5.8	5.99	14.51
6.6	50.72	32.82	6.6	43.19	24.94	6.6	59.00	15.57	6.7	59.54	16.24	6.8	6.29	14.49
7.6	50.86	33.16	7.6	43.84	25.27	7.6	59.20	15.78	7.7	59.84	16.37	7.8	6.58	14.49
8.6	50.99	33.50	8.6	44.48	25.58	8.6	59.38	16.01	8.7	60.12	16.48	8.8	6.87	14.48
9.6	51.12	33.82	9.6	45.11	25.87	9.6	59.59	16.25	9.7	60.40	16.59	9.8	7.15	14.45
10.6	51.25	34.13	10.6	45.79	26.15	10.6	59.74	16.52	10.7	60.67	16.68	10.8	7.42	14.41
11.6	51.40	34.44	11.6	46.51	26.43	11.6	59.89	16.80	11.7	60.95	16.77	11.8	7.70	14.37
12.6	51.58	34.76	12.6	47.29	26.72	12.6	60.02	17.07	12.7	61.26	16.86	12.8	7.98	14.32
13.6	51.75	35.09	13.6	48.10	27.03	13.6	60.14	17.34	13.7	61.57	16.94	13.8	8.31	14.27
14.6	51.93	35.47	14.6	48.92	27.36	14.6	60.26	17.60	14.7	61.90	17.04	14.8	8.63	14.23
15.6	52.10	35.84	15.6	49.72	27.72	15.6	60.37	17.84	15.7	62.24	17.16	15.7	8.97	14.20
16.6	52.25	36.25	16.6	50.45	28.10	16.6	60.50	18.07	16.7	62.57	17.32	16.7	9.32	14.19
17.6	52.39	36.65	17.6	51.09	28.47	17.6	60.62	18.29	17.7	62.91	17.50	17.7	9.66	14.22
18.5	52.49	37.05	18.6	51.67	28.85	18.6	60.76	18.52	18.7	63.21	17.69	18.7	10.00	14.26
19.5	52.58	37.44	19.6	52.16	29.22	19.6	60.92	18.76	19.7	63.50	17.88	19.7	10.32	14.31
20.5	52.66	37.81	20.6	52.61	29.56	20.6	61.07	19.03	20.7	63.77	18.07	20.7	10.61	14.37
21.5	52.74	38.15	21.6	53.06	29.91	21.6	61.22	19.32	21.7	64.03	18.25	21.7	10.88	14.42
22.5	52.81	38.48	22.6	53.52	30.23	22.6	61.35	19.62	22.7	64.29	18.40	22.7	11.16	14.46
23.5	52.89	38.81	23.6	54.02	30.55	23.6	61.46	19.93	23.7	64.54	18.56	23.7	11.44	14.48
24.5	52.99	39.16	24.6	54.56	30.87	24.6	61.56	20.26	24.7	64.80	18.70	24.7	11.71	14.50
25.5	53.09	39.49	25.6	55.12	31.19	25.6	61.65	20.58	25.7	65.08	18.84	25.7	12.00	14.50
26.5	53.20	39.85	26.6	55.72	31.51	26.6	61.73	20.92	26.7	65.36	18.97	26.7	12.29	14.50
27.5	53.32	40.22	27.5	56.29	31.85	27.6	61.79	21.21	27.7	65.65	19.14	27.7	12.61	14.52
28.5	53.43	40.60	28.5	56.85	32.21	28.6	61.86	21.51	28.7	65.95	19.31	28.7	12.92	14.55
29.5	53.52	40.98	29.5	57.38	32.58	29.5	61.92	21.81	29.7	66.25	19.50	29.7	13.25	14.60
30.5	53.60	41.37	30.5	57.87	32.96	30.5	61.99	22.09	30.6	66.54	19.69	30.7	13.57	14.68
31.5	53.67	41.76	31.5	58.31	33.34	31.5	62.07	22.38	31.6	66.84	19.92	31.7	13.89	14.76
	13.74	+13.71		50.90	+50.89		11.88	−11.84		12.30	+12.26		11.84	+11.79
0h	57m	24s.633	1h	31m	11s.709	1h	41m	54s.846	4h	10m	37s.831	5h	25m	50s.330
+85°	49′	24″.14	+88°	52′	20″.55	−85°	10′	45″.22	+85°	20′	28″.88	+85°	9′	34″.51

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			**ζ Mensæ.** Mag. 5.6			**51 H. Cephei.** Mag. 5.3			**25 H. Camelop.** Mag. 5.1			**7 G. Octantis.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	5 45	−84 49	Sept.	6 46	−80 43	Sept.	7 3	+87 10	Sept.	7 14	+82 33	Sept.	7 15	−86 54
	s	″		s	″		s	″		s	″		s	″
0.8	34.98	28.90	0.8	39.64	37.83	0.8	12.71	20.02	0.9	13.07	53.95	0.9	5.75	15.77
1.8	35.19	28.81	1.8	39.75	37.66	1.8	13.16	19.80	1.9	13.25	53.72	1.9	6.04	15.59
2.8	35.40	28.72	2.8	39.85	37.49	2.8	13.63	19.59	2.9	13.43	53.50	2.9	6.31	15.41
3.8	35.60	28.62	3.8	39.96	37.32	3.8	14.10	19.39	3.8	13.60	53.29	3.9	6.59	15.21
4.8	35.82	28.52	4.8	40.06	37.15	4.8	14.58	19.20	4.8	13.79	53.09	4.8	6.86	15.00
5.8	36.04	28.42	5.8	40.16	36.97	5.8	15.07	19.02	5.8	13 98	52.91	5.8	7.14	14.80
6.8	36.26	28.31	6.8	40.29	36.78	6.8	15.55	18.87	6.8	14.16	52.75	6.8	7.42	14.59
7.8	36.48	28.19	7.8	40.41	36.59	7.8	16.01	18.73	7.8	14.33	52.60	7.8	7.73	14.39
8.8	36.72	28.09	8.8	40.53	36.41	8.8	16.45	18.58	8.8	14.51	52.45	8.8	8.05	14.17
9.8	36.97	28.02	9.8	40.65	36.26	9.8	16.88	18.44	9.8	14.66	52.28	9.8	8.41	13.97
10.8	37.22	27.96	10.8	40.79	36.11	10.8	17.30	18.27	10.8	14.81	52.11	10.8	8.78	13.80
11.8	37.48	27.92	11.8	40.92	36.00	11.8	17.72	18.10	11.8	14.98	51.92	11.8	9.15	13.65
12.8	37.72	27.92	12.8	41.05	35.91	12.8	18.15	17.91	12.8	15.15	51.72	12.8	9.52	13.52
13.8	37.95	27.92	13.8	41.18	35.82	13.8	18.61	17.72	13.8	15.32	51.52	13.8	9.86	13.41
14.8	38.17	27.93	14.8	41.31	35.77	14.8	19.10	17.53	14.8	15.50	51.29	14.8	10.21	13.32
15.8	38.38	27.93	15.8	41.41	35.68	15.8	19.63	17.34	15.8	15.70	51.09	15.8	10.54	13.22
16.8	38.60	27.92	16.8	41.54	35.60	16.8	20.18	17.19	16.8	15.92	50.91	16.8	10.85	13.11
17.8	38.81	27.89	17.8	41.66	35.49	17.8	20.73	17.06	17.8	16.13	50.76	17.8	11.15	12.98
18.7	39.03	27.84	18.8	41.78	35.38	18.8	21.27	16.96	18.8	16.33	50.63	18.8	11.47	12.83
19.7	39.26	27.80	19.8	41.90	35.26	19.8	21.79	16.86	19.8	16.54	50.53	19.8	11.81	12.67
20.7	39.49	27.78	20.8	42.03	35.15	20.8	22.27	16.77	20.8	16.73	50.43	20.8	12.17	12.52
21.7	39.76	27.77	21.8	42.16	35.05	21.8	22.75	16.69	21.8	16.91	50.32	21.8	12.55	12.38
22.7	40.02	27.78	22.8	42.31	34.96	22.8	23.21	16.60	22.8	17.08	50.21	22.8	12.97	12.24
23.7	40.28	27.82	23.8	42.45	34.90	23.8	23.65	16.50	23.8	17.24	50.08	23.8	13.38	12.14
24.7	40.53	27.86	24.8	42.59	34.86	24.8	24.10	16.37	24.8	17.41	49.95	24.8	13.80	12.07
25.7	40.77	27.91	25.8	42.74	34.86	25.8	24.56	16.24	25.8	17.58	49.81	25.8	14.21	12.01
26.7	41.02	28.00	26.8	42.88	34.85	26.8	25.03	16.11	26.8	17.76	49.66	26.8	14.61	11.96
27.7	41.26	28.08	27.8	43.02	34.84	27.8	25.53	16.00	27.8	17.95	49.52	27.8	15.00	11.92
28.7	41.48	28.16	28.8	43.15	34.83	28.8	26.05	15.89	28.8	18.14	49.39	28.8	15.39	11.88
29.7	41.71	28.22	29.8	43.29	34.82	29.8	26.58	15.78	29.8	18.35	49.29	29.8	15.78	11.84
30.7	41.93	28.30	30.8	43.42	34.83	30.8	27.13	15.69	30.8	18.55	49.19	30.8	16.15	11.79
31.7	42.15	28.37	31.8	43.54	34.80	31.8	27.67	15.62	31.8	18.78	49.09	31.8	16.51	11.74
	11.09	−11.04		6.21	−6.12		20.26	+20.24		7.73	+7.66		18.51	−18.49
$5^h\ 45^m\ 51^s.396$			$6^h\ 46^m\ 48^s.653$			$7^h\ 3^m\ 2^s.335$			$7^h\ 14^m\ 7^s.912$			$7^h\ 15^m\ 39^s.691$		
−84° 49′ 44″.27			−80° 43′ 46″.14			+87° 10′ 43″.86			+82° 34′ 17″.32			−86° 54′ 19″.75		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	8 17	+88 52	Sept.	9 8	−85 20	Sept.	9 25	+81 40	Sept.	9 36	−80 34	Sept.	10 21	+82 57
	s	″		s	″		s	″		s	″		s	″
0.9	41.97	13.22	0.9	21.52	37.17	0.9	37.79	48.31	0.9	11.27	52.40	0.9	14.81	58.66
1.9	42.78	12.91	1.9	21.62	36.91	1.9	37.86	47.95	1.9	11.31	52.12	1.9	14.85	58.27
2.9	43.64	12.60	2.9	21.72	36.64	2.9	37.94	47.61	2.9	11.34	51.84	2.9	14.88	57.88
3.9	44.53	12.31	3.9	21.81	36.38	3.9	38.02	47.26	3.9	11.38	51.56	3.9	14.93	57.50
4.9	45.47	12.03	4.9	21.89	36.10	4.9	38.12	46.91	4.9	11.41	51.28	4.9	14.99	57.12
5.9	46.42	11.76	5.9	21.98	35.79	5.9	38.22	46.57	5.9	11.45	50.97	5.9	15.05	56.75
6.9	47.39	11.50	6.9	22.06	35.48	6.9	38.31	46.25	6.9	11.48	50.65	6.9	15.12	56.39
7.9	48.32	11.25	7.9	22.16	35.19	7.9	38.40	45.94	7.9	11.52	50.34	7.9	15.18	56.05
8.9	49.21	11.00	8.9	22.28	34.89	8.9	38.49	45.65	8.9	11.56	50.03	8.9	15.24	55.72
9.9	50.05	10.76	9.9	22.41	34.58	9.9	38.56	45.35	9.9	11.60	49.71	9.9	15.29	55.38
10.9	50.85	10.51	10.9	22.55	34.28	10.9	38.62	45.05	10.9	11.66	49.40	10.9	15.34	55.05
11.9	51.65	10.24	11.9	22.72	33.99	11.9	38.70	44.74	11.9	11.73	49.13	11.9	15.38	54.71
12.9	52.48	9.97	12.9	22.89	33.75	12.9	38.78	44.41	12.9	11.80	48.83	12.9	15.41	54.36
13.9	53.36	9.68	13.9	23.05	33.53	13.9	38.86	44.05	13.9	11.87	48.58	13.9	15.45	53.97
14.9	54.32	9.39	14.9	23.23	33.33	14.9	38.95	43.69	14.9	11.95	48.33	14.9	15.51	53.55
15.9	55.37	9.10	15.9	23.37	33.11	15.9	39.05	43.33	15.9	12.03	48.10	15.9	15.59	53.15
16.9	56.48	8.82	16.9	23.51	32.87	16.9	39.18	42.99	16.9	12.09	47.88	16.9	15.68	52.76
17.9	57.62	8.57	17.9	23.65	32.66	17.9	39.30	42.64	17.9	12.15	47.63	17.9	15.77	52.38
18.9	58.78	8.33	18.9	23.78	32.41	18.9	39.43	42.33	18.9	12.21	47.36	18.9	15.86	51.99
19.9	59.91	8.12	19.9	23.92	32.15	19.9	39.56	42.04	19.9	12.26	47.08	19.9	15.97	51.67
20.8	60.96	7.92	20.9	24.07	31.88	20.9	39.67	41.76	20.9	12.33	46.80	20.9	16.08	51.34
21.8	61.96	7.72	21.9	24.25	31.61	21.9	39.78	41.49	21.9	12.39	46.50	21.9	16.16	51.03
22.8	62.93	7.51	22.9	24.44	31.35	22.9	39.88	41.22	22.9	12.48	46.22	22.9	16.23	50.70
23.8	63.87	7.30	23.9	24.63	31.10	23.9	39.97	40.95	23.9	12.57	45.94	23.9	16.31	50.38
24.8	64.80	7.08	24.9	24.85	30.86	24.9	40.06	40.67	24.9	12.66	45.68	24.9	16.37	50.05
25.8	65.76	6.86	25.9	25.07	30.66	25.9	40.16	40.34	25.9	12.76	45.44	25.9	16.44	49.72
26.8	66.76	6.64	26.9	25.30	30.46	26.9	40.26	40.05	26.9	12.86	45.22	26.9	16.52	49.38
27.8	67.80	6.41	27.9	25.52	30.27	27.9	40.37	39.73	27.9	12.96	45.02	27.9	16.61	49.01
28.8	68.89	6.18	28.9	25.72	30.10	28.9	40.50	39.42	28.9	13.06	44.81	28.9	16.70	48.65
29.8	70.03	5.96	29.9	25.93	29.91	29.9	40.62	39.12	29.9	13.17	44.61	29.9	16.80	48.29
30.8	71.21	5.76	30.9	26.13	29.74	30.9	40.75	38.83	30.9	13.26	44.42	30.9	16.91	47.93
31.8	72.42	5.56	31.9	26.33	29.57	31.9	40.89	38.54	31.9	13.35	44.22	31.9	17.04	47.59
	50.67	+50.66		12.32	−12.28		6.91	+6.84		6.11	−6.03		8.16	+8.10
	$8^{h}\ 17^{m}\ 47^{s}.546$			$9^{h}\ 8^{m}\ 41^{s}.594$			$9^{h}\ 25^{m}\ 39^{s}.275$			$9^{h}\ 36^{m}\ 19^{s}.026$			$10^{h}\ 21^{m}\ 19^{s}.949$	
		+88° 52′ 37″.80			−85° 20′ 26″.78			+81° 41′ 10″.13			−80° 34′ 39″.26			+82° 58′ 17″.67

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. **Mag. 6.3**			**Bradley 1672.** **Mag. 6.3**			**ι Octantis.** **Mag. 5.4**			**32 H. Camelop.** *seq.* **Mag. 5.3**			**κ Octantis.** **Mag. 5.6**		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	10 59	−84 9	Sept.	12 13	+88 8	Sept.	12 46	−84 41	Sept.	12 48	+83 50	Sept.	13 27	−85 22
	s	″		s	″		s	″		s	″		s	″
1.0	44.63	51.37	1.1	45.69	45.86	1.1	16.82	30.02	1.1	19.47	64.92	1.1	34.14	48.87
2.0	44.62	51.08	2.1	45.39	45.49	2.1	16.72	29.78	2.1	19.36	64.59	2.1	33.99	48.66
3.0	44.61	50.80	3.1	45.11	45.12	3.1	16.61	29.53	3.1	19.26	64.25	3.1	33.84	48.45
4.0	44.59	50.51	4.1	44.88	44.75	4.1	16.51	29.29	4.1	19.15	63.89	4.1	33.67	48.25
5.0	44.56	50.21	5.1	44.68	44.38	5.1	16.39	29.05	5.1	19.06	63.53	5.1	33.50	48.03
6.0	44.53	49.91	6.1	44.52	44.01	6.1	16.26	28.80	6.1	18.97	63.20	6.1	33.33	47.81
6.9	44.52	49.61	7.0	44.37	43.63	7.1	16.14	28.54	7.1	18.91	62.86	7.1	33.15	47.59
7.9	44.50	49.29	8.0	44.23	43.27	8.1	16.01	28.26	8.1	18.84	62.51	8.1	32.97	47.35
8.9	44.49	48.96	9.0	44.09	42.93	9.1	15.90	27.97	9.1	18.76	62.19	9.1	32.79	47.08
9.9	44.49	48.60	10.0	43.92	42.59	10.1	15.79	27.65	10.1	18.68	61.86	10.1	32.61	46.81
10.9	44.50	48.26	11.0	43.74	42.26	11.1	15.69	27.34	11.1	18.59	61.55	11.1	32.47	46.53
11.9	44.53	47.93	12.0	43.51	41.92	12.1	15.63	27.03	12.1	18.49	61.23	12.1	32.34	46.24
12.9	44.57	47.61	13.0	43.26	41.55	13.1	15.57	26.72	13.1	18.39	60.90	13.1	32.23	45.96
13.9	44.62	47.31	14.0	43.01	41.17	14.1	15.52	26.43	14.1	18.28	60.53	14.1	32.14	45.67
14.9	44.68	47.04	15.0	42.80	40.77	15.0	15.49	26.16	15.1	18.19	60.17	15.1	32.06	45.42
15.9	44.72	46.77	16.0	42.62	40.35	16.0	15.45	25.90	16.0	18.11	59.78	16.1	31.97	45.18
16.9	44.76	46.50	17.0	42.50	39.92	17.0	15.39	25.63	17.0	18.05	59.37	17.1	31.87	44.95
17.9	44.79	46.22	18.0	42.44	39.51	18.0	15.32	25.36	18.0	17.99	58.96	18.1	31.74	44.71
18.9	44.81	45.94	19.0	42.40	39.12	19.0	15.26	25.09	19.0	17.94	58.58	19.1	31.62	44.46
19.9	44.84	45.62	20.0	42.40	38.73	20.0	15.18	24.81	20.0	17.91	58.20	20.1	31.49	44.19
20.9	44.87	45.30	21.0	42.40	38.37	21.0	15.10	24.49	21.0	17.88	57.84	21.1	31.36	43.92
21.9	44.90	44.96	22.0	42.36	38.02	22.0	15.03	24.17	22.0	17.83	57.50	22.1	31.23	43.60
22.9	44.95	44.62	23.0	42.31	37.68	23.0	14.97	23.84	23.0	17.79	57.17	23.1	31.12	43.28
23.9	45.01	44.28	24.0	42.24	37.34	24.0	14.93	23.49	24.0	17.73	56.84	24.1	31.02	42.96
24.9	45.10	43.96	24.9	42.15	36.98	25.0	14.92	23.14	25.0	17.68	56.50	25.1	30.94	42.64
25.9	45.19	43.67	25.9	42.05	36.61	26.0	14.90	22.80	26.0	17.61	56.15	26.0	30.88	42.31
26.9	45.29	43.38	26.9	41.96	36.24	27.0	14.90	22.48	27.0	17.55	55.78	27.0	30.83	41.98
27.9	45.39	43.09	27.9	41.89	35.86	28.0	14.91	22.16	28.0	17.49	55.40	28.0	30.79	41.67
28.9	45.49	42.81	28.9	41.83	35.47	29.0	14.91	21.86	29.0	17.45	55.02	29.0	30.75	41.38
29.9	45.58	42.54	29.9	41.82	35.06	30.0	14.91	21.57	30.0	17.41	54.64	30.0	30.71	41.08
30.9	45.67	42.28	30.9	41.82	34.65	31.0	14.92	21.27	31.0	17.39	54.23	31.0	30.67	40.80
31.9	45.75	42.02	31.9	41.87	34.25	32.0	14.92	20.98	32.0	17.38	53.81	32.0	30.63	40.53
	9.83	−9.78		30.89	+30.87		10.81	−10.76		9.34	+9.28		12.41	−12.37
$10^{h}\ 59^{m}\ 54^{s}.546$			$12^{h}\ 14^{m}\ 29^{s}.190$			$12^{h}\ 46^{m}\ 19^{s}.119$			$12^{h}\ 48^{m}\ 31^{s}.308$			$13^{h}\ 27^{m}\ 32^{s}.891$		
−84° 9′ 29″.33			+88° 8′ 56″.19			−84° 41′ 1″.57			+83° 51′ 11″.30			−85° 22′ 19″.48		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			50 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	14 13	−83 18	Sept.	15 2	+87 32	Sept.	15 24	−84 12	Sept.	16 54	+82 10	Sept.	17 16	−80 47
	s	″		s	″		s	″		s	″		s	″
1.1	51.56	23.35	1.2	28.39	50.24	1.2	34.84	21.71	1.3	7.41	39.83	1.3	30.17	30.80
2.1	51.44	23.18	2.2	27.84	50.06	2.2	34.67	21.63	2.3	7.22	39.84	2.3	30.06	30.84
3.1	51.32	23.03	3.2	27.31	49.87	3.2	34.51	21.54	3.3	7.04	39.84	3.3	29.96	30.90
4.1	51.19	22.87	4.2	26.78	49.67	4.2	34.33	21.46	4.3	6.85	39.83	4.3	29.86	30.95
5.1	51.06	22.71	5.2	26.27	49.45	5.2	34.15	21.37	5.2	6.66	39.80	5.3	29.74	31.00
6.1	50.91	22.54	6.2	25.79	49.23	6.2	33.97	21.28	6.2	6.48	39.76	6.3	29.63	31.06
7.1	50.77	22.36	7.2	25.32	49.00	7.2	33.77	21.19	7.2	6.30	39.70	7.3	29.50	31.13
8.1	50.62	22.18	8.2	24.87	48.77	8.2	33.57	21.10	8.2	6.13	39.65	8.3	29.37	31.20
9.1	50.47	21.96	9.2	24.43	48.57	9.2	33.37	20.97	9.2	5.96	39.61	9.3	29.23	31.23
10.1	50.32	21.73	10.2	23.98	48.37	10.2	33.16	20.83	10.2	5.80	39.58	10.3	29.09	31.25
11.1	50.18	21.48	11.2	23.52	48.20	11.2	32.96	20.66	11.2	5.63	39.55	11.2	28.94	31.25
12.1	50.07	21.22	12.2	23.03	48.02	12.2	32.77	20.48	12.2	5.46	39.54	12.2	28.81	31.21
13.1	49.96	20.97	13.1	22.52	47.84	13.2	32.61	20.30	13.2	5.28	39.53	13.2	28.67	31.16
14.1	49.87	20.74	14.1	21.99	47.63	14.2	32.46	20.13	14.2	5.09	39.51	14.2	28.57	31.11
15.1	49.79	20.50	15.1	21.45	47.40	15.2	32.33	19.95	15.2	4.89	39.48	15.2	28.46	31.07
16.1	49.71	20.29	16.1	20.93	47.16	16.2	32.19	19.80	16.2	4.70	39.44	16.2	28.37	31.03
17.1	49.62	20.09	17.1	20.44	46.89	17.2	32.05	19.66	17.2	4.51	39.35	17.2	28.26	31.02
18.1	49.52	19.89	18.1	19.97	46.60	18.2	31.90	19.53	18.2	4.32	39.25	18.2	28.16	31.03
19.1	49.39	19.67	19.1	19.54	46.32	19.1	31.72	19.39	19.2	4.14	39.12	19.2	28.03	31.03
20.1	49.27	19.44	20.1	19.14	46.04	20.1	31.54	19.24	20.2	3.97	39.00	20.2	27.90	31.02
21.1	49.15	19.20	21.1	18.76	45.76	21.1	31.36	19.06	21.2	3.80	38.89	21.2	27.77	31.01
22.1	49.02	18.92	22.1	18.37	45.51	22.1	31.17	18.88	22.2	3.63	38.78	22.2	27.63	30.97
23.1	48.92	18.63	23.1	17.99	45.27	23.1	30.98	18.65	23.2	3.47	38.69	23.2	27.49	30.89
24.1	48.82	18.34	24.1	17.57	45.04	24.1	30.81	18.41	24.2	3.30	38.60	24.2	27.35	30.81
25.1	48.73	18.04	25.1	17.15	44.82	25.1	30.66	18.16	25.2	3.14	38.52	25.2	27.20	30.71
26.1	48.64	17.74	26.1	16.72	44.58	26.1	30.51	17.92	26.2	2.96	38.45	26.2	27.07	30.60
27.1	48.58	17.44	27.1	16.29	44.33	27.1	30.37	17.67	27.2	2.79	38.37	27.2	26.96	30.49
28.1	48.52	17.14	28.1	15.83	44.06	28.1	30.24	17.43	28.2	2.62	38.28	28.2	26.85	30.38
29.1	48.45	16.86	29.1	15.40	43.79	29.1	30.12	17.20	29.2	2.44	38.18	29.2	26.74	30.25
30.1	48.40	16.59	30.1	14.97	43.51	30.1	30.01	16.97	30.2	2.25	38.04	30.2	26.63	30.14
31.1	48.34	16.33	31.1	14.56	43.20	31.1	29.90	16.77	31.2	2.07	37.90	31.2	26.52	30.04
32.1	48.28	16.07	32.1	14.18	42.88	32.1	29.77	16.56	32.2	1.90	37.73	32.2	26.41	29.94

8.58 −8.52	23.36 +23.34	9.90 −9.85	7.35 +7.28	6.25 −6.17
14h 13m 46s.350	15h 3m 2s.510	15h 24m 23s.351	16h 54m 12s.991	17h 16m 17s.234
−83° 17′ 54″.52	+87° 32′ 42″.66	−84° 11′ 55″.43	+82° 10′ 21″.42	−80° 47′ 14″.27

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. **Mag. 4.4**			**χ Octantis.** **Mag. 5.2**			**λ Ursæ Minoris.** **Mag. 6.6**			**σ Octantis.** **Mag. 5.5**			**76 Draconis.** **Mag. 5.7**		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	17 57	+86 37	Sept.	18 7	−87 40	Sept.	18 59	+89 1	Sept.	19 32	−89 13	Sept.	20 48	+82 14
	s	″		s	″		s	″		s	″		s	″
1.3	71.56	13.29	1.3	71.25	2.83	1.3	54.59	37.21	1.4	80.90	14.71	1.4	38.03	22.12
2.3	71.14	13.41	2.3	70.83	2.94	2.3	53.29	37.43	2.4	79.91	14.92	2.4	37.94	22.46
3.3	70.72	13.51	3.3	70.41	3.05	3.3	51.96	37.63	3.4	78.96	15.13	3.4	37.85	22.80
4.3	70.28	13.61	4.3	70.00	3.16	4.3	50.58	37.81	4.4	78.01	15.35	4.4	37.74	23.13
5.3	69.85	13.68	5.3	69.57	3.29	5.3	49.19	37.99	5.4	77.04	15.57	5.4	37.64	23.45
6.3	69.43	13.73	6.3	69.12	3.42	6.3	47.81	38.13	6.4	76.04	15.79	6.4	37.53	23.75
7.3	69.01	13.77	7.3	68.66	3.56	7.3	46.45	38.27	7.4	74.95	16.02	7.4	37.42	24.04
8.3	68.62	13.81	8.3	68.17	3.69	8.3	45.14	38.41	8.3	73.78	16.26	8.4	37.30	24.31
9.3	68.23	13.87	9.3	67.65	3.79	9.3	43.88	38.56	9.3	72.52	16.49	9.4	37.19	24.59
10.3	67.84	13.95	10.3	67.10	3.88	10.3	42.66	38.73	10.3	71.18	16.68	10.4	37.09	24.88
11.3	67.45	14.03	11.3	66.55	3.94	11.3	41.44	38.90	11.3	69.78	16.86	11.4	36.99	25.17
12.3	67.05	14.11	12.3	66.03	4.00	12.3	40.19	39.07	12.3	68.38	17.02	12.4	36.89	25.49
13.3	66.64	14.21	13.3	65.52	4.03	13.3	38.89	39.27	13.3	67.01	17.15	13.4	36.79	25.81
14.3	66.21	14.30	14.3	65.05	4.04	14.3	37.51	39.46	14.3	65.72	17.27	14.4	36.68	26.14
15.3	65.75	14.39	15.3	64.61	4.07	15.3	36.04	39.64	15.3	64.50	17.39	15.4	36.58	26.47
16.3	65.29	14.44	16.3	64.18	4.10	16.3	34.51	39.79	16.3	63.36	17.52	16.4	36.45	26.79
17.3	64.82	14.45	17.3	63.76	4.15	17.3	32.96	39.93	17.3	62.24	17.67	17.4	36.32	27.09
18.3	64.36	14.46	18.3	63.31	4.21	18.3	31.40	40.04	18.3	61.09	17.84	18.4	36.18	27.38
19.3	63.93	14.45	19.3	62.84	4.30	19.3	29.87	40.14	19.3	59.88	18.01	19.4	36.03	27.63
20.3	63.50	14.44	20.3	62.33	4.37	20.3	28.43	40.22	20.3	58.57	18.17	20.4	35.90	27.87
21.2	63.08	14.42	21.3	61.78	4.43	21.3	27.04	40.30	21.3	57.15	18.34	21.4	35.76	28.11
22.2	62.70	14.41	22.3	61.22	4.45	22.3	25.71	40.37	22.3	55.63	18.49	22.4	35.63	28.33
23.2	62.29	14.42	23.3	60.65	4.46	23.3	24.39	40.47	23.3	54.04	18.63	23.4	35.51	28.56
24.2	61.89	14.43	24.2	60.08	4.45	24.3	23.08	40.58	24.3	52.42	18.74	24.4	35.38	28.81
25.2	61.49	14.45	25.2	59.51	4.41	25.3	21.74	40.70	25.3	50.81	18.84	25.4	35.26	29.08
26.2	61.08	14.47	26.2	58.97	4.37	26.3	20.38	40.81	26.3	49.21	18.91	26.4	35.14	29.34
27.2	60.66	14.48	27.2	58.45	4.32	27.3	18.96	40.93	27.3	47.66	18.97	27.4	35.01	29.61
28.2	60.23	14.49	28.2	57.95	4.26	28.3	17.51	41.05	28.3	46.16	19.04	28.3	34.89	29.88
29.2	59.78	14.49	29.2	57.46	4.22	29.3	16.01	41.15	29.3	44.71	19.12	29.3	34.75	30.13
30.2	59.33	14.48	30.2	56.98	4.19	30.3	14.46	41.24	30.3	43.29	19.20	30.3	34.61	30.38
31.2	58.89	14.44	31.2	56.51	4.15	31.3	12.91	41.33	31.3	41.89	19.28	31.3	34.45	30.62
32.2	58.44	14.39	32.2	56.04	4.11	32.3	11.33	41.38	32.3	40.50	19.35	32.3	34.29	30.85
	16.96	+16.94		24.57	−24.55		58.93	+58.92		73.60	−73.59		7.41	+7.34
$17^{h}\ 58^{m}\ 22^{s}.311$			$18^{h}\ 7^{m}\ 23^{s}.343$			$19^{h}\ 0^{m}\ 15^{s}.079$			$19^{h}\ 30^{m}\ 50^{s}.769$			$20^{h}\ 48^{m}\ 32^{s}.146$		
+86° 36′ 51″.04			−87° 39′ 50″.89			+89° 1′ 12″.80			−89° 13′ 13″.35			+82° 13′ 56″.82		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			**ν Octantis.** Mag. 5.7			**β Octantis.** Mag. 4.3			**39 H. Cephei.** Mag. 5.6			**γ^1 Octantis.** Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	21 38	−83 5	Sept.	22 16	−86 22	Sept.	22 38	−81 48	Sept.	23 28	+86 51	Sept.	23 47	−82 27
	s	″		s	″		s	″		s	″		s	″
1.5	56.12	18.90	1.5	61.03	31.83	1.5	4.76	3.00	1.5	10.96	54.10	1.5	34.04	41.25
2.5	56.09	19.18	2.5	61.02	32.10	2.5	4.77	3.28	2.5	11.06	54.50	2.5	34.10	41.52
3.5	56.06	19.45	3.5	61.01	32.38	3.5	4.78	3.55	3.5	11.12	54.91	3.5	34.15	41.78
4.4	56.03	19.71	4.5	61.01	32.66	4.5	4.80	3.83	4.5	11.17	55.31	4.5	34.21	42.03
5.4	56.02	19.99	5.5	61.01	32.94	5.5	4.82	4.12	5.5	11.20	55.69	5.5	34.27	42.30
6.4	55.99	20.30	6.5	61.01	33.26	6.5	4.84	4.43	6.5	11.21	56.08	6.5	34.34	42.57
7.4	55.96	20.61	7.5	61.01	33.57	7.5	4.85	4.74	7.5	11.22	56.47	7.5	34.40	42.87
8.4	55.92	20.93	8.5	60.97	33.89	8.5	4.85	5.06	8.5	11.22	56.84	8.5	34.45	43.18
9.4	55.87	21.25	9.5	60.93	34.22	9.5	4.85	5.39	9.5	11.23	57.18	9.5	34.50	43.51
10.4	55.79	21.57	10.5	60.85	34.56	10.5	4.83	5.72	10.5	11.26	57.52	10.5	34.54	43.83
11.4	55.71	21.85	11.5	60.75	34.88	11.5	4.80	6.04	11.5	11.30	57.88	11.5	34.55	44.16
12.4	55.62	22.13	12.5	60.62	35.17	12.5	4.76	6.36	12.5	11.35	58.24	12.5	34.56	44.48
13.4	55.53	22.38	13.4	60.49	35.46	13.5	4.72	6.64	13.5	11.41	58.62	13.5	34.56	44.78
14.4	55.45	22.63	14.4	60.38	35.73	14.5	4.68	6.92	14.5	11.46	59.03	14.5	34.56	45.07
15.4	55.38	22.87	15.4	60.28	35.97	15.5	4.65	7.18	15.5	11.50	59.46	15.5	34.57	45.34
16.4	55.32	23.09	16.4	60.19	36.21	16.5	4.63	7.43	16.5	11.50	59.89	16.5	34.59	45.61
17.4	55.26	23.33	17.4	60.11	36.48	17.5	4.62	7.69	17.5	11.47	60.32	17.5	34.62	45.88
18.4	55.21	23.60	18.4	60.06	36.77	18.5	4.61	7.97	18.5	11.42	60.74	18.5	34.65	46.16
19.4	55.16	23.87	19.4	59.98	37.08	19.4	4.59	8.27	19.5	11.35	61.12	19.5	34.68	46.45
20.4	55.08	24.14	20.4	59.89	37.39	20.4	4.56	8.58	20.5	11.27	61.49	20.5	34.70	46.77
21.4	55.00	24.43	21.4	59.77	37.72	21.4	4.52	8.89	21.5	11.19	61.85	21.5	34.71	47.10
22.4	54.89	24.73	22.4	59.63	38.04	22.4	4.48	9.22	22.5	11.14	62.19	22.5	34.72	47.44
23.4	54.76	25.01	23.4	59.47	38.34	23.4	4.42	9.55	23.5	11.09	62.53	23.5	34.70	47.79
24.4	54.64	25.29	24.4	59.29	38.63	24.4	4.35	9.86	24.5	11.05	62.89	24.5	34.67	48.13
25.4	54.52	25.53	25.4	59.10	38.91	25.4	4.29	10.16	25.5	11.02	63.25	25.5	34.64	48.47
26.4	54.40	25.77	26.4	58.90	39.18	26.4	4.20	10.45	26.5	10.99	63.62	26.5	34.60	48.79
27.4	54.27	25.99	27.4	58.69	39.44	27.4	4.12	10.72	27.5	10.95	63.99	27.5	34.57	49.11
28.4	54.16	26.21	28.4	58.50	39.68	28.4	4.06	10.99	28.5	10.92	64.40	28.5	34.54	49.40
29.4	54.05	26.43	29.4	58.32	39.93	29.4	4.00	11.25	29.5	10.85	64.79	29.5	34.51	49.69
30.4	53.94	26.64	30.4	58.14	40.18	30.4	3.93	11.50	30.5	10.77	65.18	30.5	34.49	49.98
31.4	53.83	26.85	31.4	57.97	40.42	31.4	3.87	11.76	31.5	10.67	65.57	31.5	34.46	50.27
32.4	53.72	27.07	32.4	57.80	40.67	32.4	3.81	12.02	32.4	10.54	65.96	32.5	34.44	50.56
	8.31	−8.25		15.82	−15.79		7.01	−6.94		18.29	+18.27		7.62	−7.56
21^h 38^m $38^s.548$			22^h 16^m $33^s.212$			22^h 37^m $51^s.624$			23^h 27^m $43^s.571$			23^h 47^m $23^s.637$		
−83° 5′ 34″.33			−86° 22′ 50″.92			−81° 48′ 24″.80			+86° 51′ 38″.62			−82° 28′ 8″.42		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	0 57	+85 49	Oct.	1 32	+88 52	Oct.	1 42	−85 10	Oct.	4 11	+85 20	Oct.	5 36	+85 9
	s	″		s	″		s	″		s	″		s	″
0.5	53.60	41.37	0.5	57.87	32.96	0.5	1.99	22.09	0.6	6.54	19.69	0.7	13.57	14.68
1.5	53.67	41.76	1.5	58.31	33.34	1.5	2.07	22.38	1.6	6.84	19.92	1.7	13.89	14.76
2.5	53.73	42.16	2.5	58.69	33.73	2.5	2.15	22.66	2.6	7.12	20.14	2.7	14.21	14.85
3.5	53.77	42.55	3.5	59.02	34.11	3.5	2.24	22.95	3.6	7.39	20.39	3.7	14.52	14.96
4.5	53.80	42.94	4.5	59.29	34.50	4.5	2.32	23.24	4.6	7.63	20.63	4.7	14.81	15.09
5.5	53.81	43.31	5.5	59.52	34.88	5.5	2.40	23.55	5.6	7.87	20.87	5.7	15.10	15.20
6.5	53.82	43.69	6.5	59.76	35.24	6.5	2.46	23.88	6.6	8.11	21.10	6.7	15.37	15.31
7.5	53.85	44.03	7.5	60.01	35.58	7.5	2.53	24.22	7.6	8.34	21.29	7.7	15.64	15.41
8.5	53.88	44.38	8.5	60.31	35.92	8.5	2.57	24.57	8.6	8.57	21.50	8.7	15.92	15.50
9.5	53.92	44.72	9.5	60.66	36.25	9.5	2.58	24.91	9.6	8.82	21.70	9.7	16.19	15.56
10.5	53.98	45.09	10.5	61.04	36.60	10.5	2.59	25.25	10.6	9.08	21.90	10.7	16.47	15.62
11.5	54.04	45.46	11.5	61.46	36.97	11.5	2.58	25.59	11.6	9.36	22.12	11.7	16.80	15.70
12.5	54.10	45.86	12.5	61.85	37.35	12.5	2.57	25.90	12.6	9.64	22.35	12.7	17.12	15.79
13.5	54.14	46.27	13.5	62.19	37.76	13.5	2.57	26.19	13.6	9.93	22.58	13.7	17.45	15.91
14.5	54.16	46.70	14.5	62.46	38.18	14.5	2.57	26.47	14.6	10.21	22.85	14.7	17.77	16.05
15.5	54.17	47.12	15.5	62.63	38.61	15.5	2.59	26.75	15.6	10.46	23.14	15.7	18.09	16.23
16.5	54.14	47.53	16.5	62.73	39.01	16.5	2.62	27.04	16.6	10.70	23.44	16.7	18.39	16.39
17.5	54.09	47.91	17.5	62.76	39.39	17.5	2.65	27.35	17.6	10.91	23.73	17.7	18.67	16.56
18.5	54.04	48.29	18.5	62.76	39.77	18.5	2.66	27.67	18.6	11.11	24.01	18.7	18.92	16.73
19.5	54.00	48.63	19.5	62.77	40.14	19.5	2.67	28.01	19.6	11.31	24.28	19.7	19.17	16.87
20.5	53.96	48.96	20.5	62.81	40.48	20.5	2.66	28.37	20.6	11.50	24.53	20.7	19.41	17.05
21.5	53.94	49.29	21.5	62.90	40.82	21.5	2.63	28.74	21.6	11.69	24.78	21.7	19.65	17.20
22.5	53.93	49.62	22.5	63.00	41.17	22.5	2.60	29.11	22.6	11.89	25.00	22.6	19.91	17.34
23.5	53.92	49.98	23.5	63.14	41.53	23.5	2.56	29.45	23.6	12.09	25.23	23.6	20.17	17.46
24.5	53.91	50.32	24.5	63.27	41.89	24.5	2.49	29.80	24.6	12.32	25.49	24.6	20.44	17.60
25.4	53.88	50.69	25.5	63.37	42.25	25.5	2.43	30.13	25.6	12.53	25.76	25.6	20.72	17.74
26.4	53.85	51.06	26.5	63.47	42.62	26.5	2.36	30.45	26.6	12.75	26.03	26.6	20.99	17.92
27.4	53.82	51.44	27.5	63.52	43.00	27.5	2.30	30.77	27.6	12.97	26.31	27.6	21.27	18.09
28.4	53.78	51.82	28.5	63.50	43.39	28.5	2.24	31.06	28.6	13.19	26.62	28.6	21.55	18.27
29.4	53.72	52.21	29.5	63.44	43.80	29.5	2.19	31.36	29.6	13.39	26.93	29.6	21.83	18.47
30.4	53.63	52.59	30.5	63.32	44.19	30.5	2.14	31.65	30.6	13.58	27.24	30.6	22.10	18.70
31.4	53.53	52.96	31.5	63.14	44.58	31.5	2.09	31.94	31.6	13.76	27.58	31.6	22.35	18.94
	13.75	+13.72		51.04	+51.03		11.89	−11.84		12.31	+12.27		11.84	+11.80
$0^h\ 57^m\ 24^s.633$			$1^h\ 31^m\ 11^s.709$			$1^h\ 41^m\ 54^s.846$			$4^h\ 10^m\ 37^s.831$			$5^h\ 35^m\ 50^s.330$		
+85° 49′ 24″.14			+88° 52′ 20″.55			−85° 10′ 45″.22			+85° 20′ 28″.88			+85° 9′ 34″.51		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	5 45	−84 49	Oct.	6 46	−80 43	Oct.	7 3	+87 10	Oct.	7 14	+82 33	Oct.	7 15	−86 54
	s	″		s	″		s	″		s	″		s	″
0.7	41.93	28.30	0.8	43.42	34.83	0.8	27.13	15.69	0.8	18.55	49.19	0.8	16.15	11.79
1.7	42.15	28.37	1.8	43.54	34.80	1.8	27.67	15.62	1.8	18.78	49.09	1.8	16.51	11.74
2.7	42.37	28.43	2.8	43.68	34.77	2.8	28.23	15.56	2.8	18.99	49.02	2.8	16.87	11.69
3.7	42.59	28.49	3.7	43.81	34.76	3.8	28.76	15.52	3.8	19.19	48.96	3.8	17.25	11.64
4.7	42.82	28.54	4.7	43.95	34.74	4.8	29.29	15.51	4.8	19.40	48.91	4.8	17.62	11.57
5.7	43.06	28.62	5.7	44.08	34.73	5.8	29.81	15.49	5.8	19.60	48.86	5.8	18.03	11.50
6.7	43.31	28.71	6.7	44.22	34.73	6.8	30.29	15.46	6.8	19.79	48.82	6.8	18.44	11.45
7.7	43.56	28.81	7.7	44.37	34.76	7.7	30.77	15.42	7.8	19.97	48.76	7.8	18.86	11.44
8.7	43.81	28.94	8.7	44.51	34.81	8.7	31.24	15.38	8.8	20.15	48.68	8.8	19.29	11.44
9.7	44.04	29.09	9.7	44.66	34.89	9.7	31.71	15.32	9.8	20.33	48.60	9.8	19.72	11.47
10.7	44.26	29.27	10.7	44.80	34.97	10.7	32.21	15.23	10.7	20.52	48.52	10.8	20.15	11.51
11.7	44.47	29.45	11.7	44.94	35.08	11.7	32.75	15.17	11.7	20.72	48.42	11.7	20.56	11.56
12.7	44.67	29.62	12.7	45.08	35.18	12.7	33.30	15.11	12.7	20.94	48.33	12.7	20.94	11.62
13.7	44.85	29.77	13.7	45.19	35.27	13.7	33.87	15.07	13.7	21.17	48.28	13.7	21.31	11.68
14.7	45.05	29.92	14.7	45.31	35.36	14.7	34.47	15.06	14.7	21.40	48.23	14.7	21.66	11.72
15.7	45.24	30.06	15.7	45.44	35.42	15.7	35.04	15.06	15.7	21.63	48.22	15.7	22.02	11.74
16.7	45.44	30.19	16.7	45.56	35.47	16.7	35.61	15.09	16.7	21.84	48.23	16.7	22.38	11.75
17.7	45.66	30.32	17.7	45.70	35.53	17.7	36.13	15.13	17.7	22.05	48.25	17.7	22.76	11.76
18.7	45.88	30.46	18.7	45.83	35.60	18.7	36.62	15.17	18.7	22.25	48.27	18.7	23.17	11.79
19.7	46.11	30.63	19.7	45.97	35.69	19.7	37.10	15.21	19.7	22.43	48.28	19.7	23.59	11.82
20.7	46.33	30.81	20.7	46.12	35.81	20.7	37.57	15.24	20.7	22.61	48.28	20.7	24.03	11.88
21.7	46.55	31.03	21.7	46.26	35.94	21.7	38.02	15.25	21.7	22.78	48.28	21.7	24.47	11.97
22.7	46.77	31.25	22.7	46.40	36.08	22.7	38.49	15.26	22.7	22.96	48.27	22.7	24.89	12.07
23.7	46.97	31.48	23.7	46.53	36.26	23.7	38.97	15.27	23.7	23.14	48.25	23.7	25.31	12.20
24.6	47.16	31.71	24.7	46.67	36.43	24.7	39.47	15.27	24.7	23.34	48.23	24.7	25.72	12.32
25.6	47.34	31.95	25.7	46.80	36.60	25.7	39.98	15.28	25.7	23.54	48.22	25.7	26.11	12.45
26.6	47.52	32.19	26.7	46.93	36.77	26.7	40.50	15.31	26.7	23.74	48.23	26.7	26.48	12.58
27.6	47.69	32.43	27.7	47.05	36.96	27.7	41.05	15.35	27.7	23.95	48.25	27.7	26.84	12.71
28.6	47.86	32.66	28.7	47.17	37.12	28.7	41.59	15.39	28.7	24.17	48.28	28.7	27.21	12.84
29.6	48.03	32.89	29.7	47.28	37.27	29.7	42.12	15.47	29.7	24.39	48.33	29.7	27.55	12.95
30.6	48.20	33.10	30.7	47.39	37.42	30.7	42.65	15.55	30.7	24.59	48.39	30.7	27.91	13.05
31.6	48.37	33.30	31.7	47.52	37.56	31.7	43.17	15.66	31.7	24.80	48.48	31.7	28.27	13.16
	11.09	−11.04		6.21	−6.12		20.26	+20.24		7.73	+7.66		18.51	−18.48
	5h 45m 51s.396			6h 46m 48s.653			7h 3m 2s.335			7h 14m 7s.912			7h 15m 39s.691	
		−84° 49′ 44″.27			−80° 43′ 46″.14			+87° 10′ 43″.86			+82° 34′ 17″.32			−86° 54′ 19″.75

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	8 18	+88 52	Oct.	9 8	−85 20	Oct.	9 25	+81 40	Oct.	9 36	−80 34	Oct.	10 21	+82 57
	s	″		s	″		s	″		s	″		s	″
0.8	11.21	5.76	0.9	26.13	29.74	0.9	40.75	38.83	0.9	13.26	44.42	0.9	16.91	47.93
1.8	12.42	5.56	1.9	26.33	29.57	1.9	40.89	38.54	1.9	13.35	44.22	1.9	17.04	47.59
2.8	13.65	5.38	2.8	26.53	29.39	2.9	41.04	38.25	2.9	13.44	43.99	2.9	17.17	47.26
3.8	14.89	5.23	3.8	26.72	29.19	3.9	41.19	37.98	3.9	13.53	43.77	3.9	17.30	46.93
4.8	16.11	5.08	4.8	26.93	28.99	4.9	41.33	37.74	4.9	13.62	43.55	4.9	17.44	46.61
5.8	17.29	4.94	5.8	27.13	28.79	5.9	41.46	37.51	5.9	13.72	43.33	5.9	17.56	46.32
6.8	18.42	4.80	6.8	27.36	28.58	6.9	41.59	37.28	6.9	13.82	43.10	6.9	17.67	46.03
7.8	19.50	4.65	7.8	27.60	28.40	7.8	41.72	37.05	7.9	13.93	42.87	7.9	17.78	45.74
8.8	20.56	4.48	8.8	27.87	28.25	8.8	41.82	36.80	8.9	14.06	42.69	8.9	17.88	45.44
9.8	21.62	4.31	9.8	28.13	28.09	9.8	41.95	36.54	9.8	14.18	42.51	9.9	17.99	45.13
10.8	22.72	4.13	10.8	28.39	27.98	10.8	42.08	36.27	10.8	14.31	42.37	10.9	18.10	44.81
11.8	23.88	3.94	11.8	28.64	27.89	11.8	42.21	35.99	11.8	14.44	42.24	11.9	18.23	44.47
12.8	25.13	3.76	12.8	28.89	27.81	12.8	42.35	35.71	12.8	14.56	42.13	12.9	18.35	44.09
13.8	26.44	3.60	13.8	29.13	27.73	13.8	42.51	35.43	13.8	14.67	42.03	13.9	18.49	43.75
14.8	27.81	3.45	14.8	29.36	27.63	14.8	42.68	35.17	14.8	14.78	41.90	14.9	18.66	43.42
15.8	29.17	3.33	15.8	29.58	27.52	15.8	42.86	34.93	15.8	14.89	41.77	15.9	18.83	43.11
16.8	30.51	3.23	16.8	29.81	27.39	16.8	43.03	34.72	16.8	15.00	41.62	16.9	18.98	42.82
17.8	31.80	3.14	17.8	30.03	27.27	17.8	43.18	34.53	17.8	15.11	41.47	17.9	19.14	42.55
18.8	33.03	3.06	18.8	30.28	27.14	18.8	43.34	34.34	18.8	15.24	41.31	18.9	19.29	42.31
19.8	34.20	2.98	19.8	30.55	27.01	19.8	43.48	34.16	19.8	15.36	41.15	19.9	19.44	42.06
20.8	35.31	2.90	20.8	30.82	26.90	20.8	43.62	33.98	20.8	15.49	41.00	20.9	19.58	41.81
21.8	36.42	2.82	21.8	31.10	26.81	21.8	43.76	33.80	21.8	15.63	40.90	21.8	19.71	41.56
22.8	37.54	2.72	22.8	31.39	26.74	22.8	43.89	33.60	22.8	15.77	40.79	22.8	19.83	41.30
23.8	38.69	2.62	23.8	31.69	26.68	23.8	44.03	33.39	23.8	15.91	40.71	23.8	19.96	41.04
24.8	39.85	2.52	24.8	31.98	26.64	24.8	44.17	33.18	24.8	16.05	40.64	24.8	20.09	40.76
25.8	41.07	2.41	25.8	32.26	26.63	25.8	44.32	32.97	25.8	16.19	40.58	25.8	20.24	40.47
26.7	42.34	2.31	26.8	32.54	26.61	26.8	44.48	32.76	26.8	16.32	40.53	26.8	20.40	40.19
27.7	43.64	2.22	27.8	32.80	26.60	27.8	44.65	32.56	27.8	16.46	40.48	27.8	20.57	39.92
28.7	44.97	2.15	28.8	33.05	26.57	28.8	44.82	32.37	28.8	16.60	40.42	28.8	20.74	39.65
29.7	46.32	2.09	29.8	33.30	26.54	29.8	45.01	32.19	29.8	16.73	40.37	29.8	20.93	39.40
30.7	47.67	2.06	30.8	33.55	26.51	30.8	45.19	32.04	30.8	16.86	40.32	30.8	21.11	39.15
31.7	48.99	2.03	31.8	33.82	26.49	31.8	45.37	31.90	31.8	16.99	40.26	31.8	21.30	38.92
50.60		+50.59	12.31		−12.27	6.91		+6.84	6.11		−6.03	8.16		+8.10
$8^h\ 17^m\ 47^s.546$			$9^h\ 8^m\ 41^s.594$			$9^h\ 25^m\ 39^s.275$			$9^h\ 36^m\ 19^s.026$			$10^h\ 21^m\ 19^s.949$		
+88° 52′ 37″.80			−85° 20′ 26″.78			+81° 41′ 10″.13			−80° 34′ 39″.26			+82° 58′ 17″.67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			**Bradley 1672.** Mag. 6.3			**ι Octantis.** Mag. 5.4			**32 H. Camelop.** *seq.* Mag. 5.3			**κ Octantis.** Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	10 59	−84 9	Oct.	12 13	+88 8	Oct.	12 46	−84 41	Oct.	12 48	+83 50	Oct.	13 27	−85 22
	s	″		s	″		s	″		s	″		s	″
0.9	45.67	42.28	0.9	41.82	34.65	1.0	14.92	21.27	1.0	17.39	54.23	1.0	30.67	40.80
1.9	45.75	42.02	1.9	41.87	34.25	2.0	14.92	20.98	2.0	17.38	53.81	2.0	30.63	40.53
2.9	45.84	41.75	2.9	41.96	33.86	3.0	14.91	20.69	3.0	17.37	53.41	3.0	30.58	40.24
3.9	45.92	41.48	3.9	42.07	33.47	3.9	14.90	20.37	3.9	17.37	53.02	4.0	30.52	39.95
4.9	46.01	41.19	4.9	42.20	33.09	4.9	14.88	20.07	4.9	17.38	52.64	5.0	30.45	39.64
5.9	46.10	40.89	5.9	42.33	32.72	5.9	14.88	19.76	5.9	17.38	52.26	6.0	30.39	39.33
6.9	46.20	40.59	6.9	42.44	32.35	6.9	14.88	19.42	6.9	17.38	51.89	7.0	30.34	38.99
7.9	46.30	40.30	7.9	42.53	31.99	7.9	14.90	19.08	7.9	17.37	51.53	8.0	30.31	38.65
8.9	46.44	40.01	8.9	42.58	31.64	8.9	14.93	18.74	8.9	17.36	51.17	9.0	30.30	38.30
9.9	46.58	39.74	9.9	42.62	31.28	9.9	14.98	18.40	9.9	17.34	50.82	10.0	30.31	37.96
10.9	46.73	39.48	10.9	42.64	30.91	10.9	15.06	18.06	10.9	17.32	50.46	11.0	30.35	37.62
11.9	46.89	39.25	11.9	42.68	30.49	11.9	15.14	17.76	11.9	17.30	50.06	12.0	30.39	37.31
12.9	47.04	39.05	12.9	42.76	30.08	12.9	15.22	17.48	12.9	17.29	49.65	13.0	30.44	37.02
13.9	47.19	38.85	13.9	42.89	29.66	13.9	15.29	17.21	13.9	17.30	49.23	13.9	30.48	36.72
14.9	47.32	38.66	14.9	43.07	29.24	14.9	15.35	16.95	14.9	17.32	48.80	14.9	30.50	36.47
15.9	47.44	38.44	15.9	43.30	28.85	15.9	15.40	16.69	15.9	17.36	48.39	15.9	30.51	36.19
16.9	47.57	38.21	16.9	43.55	28.47	16.9	15.45	16.41	16.9	17.41	47.97	16.9	30.52	35.89
17.9	47.69	37.96	17.9	43.82	28.11	17.9	15.49	16.10	17.9	17.46	47.58	17.9	30.52	35.58
18.9	47.82	37.71	18.9	44.09	27.76	18.9	15.54	15.78	18.9	17.51	47.20	18.9	30.53	35.25
19.9	47.97	37.45	19.9	44.33	27.42	19.9	15.60	15.46	19.9	17.55	46.86	19.9	30.54	34.92
20.9	48.14	37.21	20.9	44.54	27.08	20.9	15.68	15.13	20.9	17.58	46.52	20.9	30.58	34.57
21.9	48.31	36.97	21.9	44.73	26.74	21.9	15.77	14.79	21.9	17.61	46.19	21.9	30.63	34.22
22.9	48.48	36.75	22.9	44.90	26.40	22.9	15.87	14.46	22.9	17.63	45.85	22.9	30.71	33.88
23.9	48.67	36.55	23.9	45.08	26.05	23.9	16.00	14.16	23.9	17.66	45.48	23.9	30.80	33.56
24.9	48.86	36.35	24.9	45.27	25.69	24.9	16.12	13.87	24.9	17.68	45.11	24.9	30.89	33.24
25.9	49.05	36.17	25.9	45.49	25.33	25.9	16.25	13.58	25.9	17.72	44.74	25.9	30.99	32.93
26.9	49.25	36.00	26.9	45.72	24.97	26.9	16.38	13.32	26.9	17.77	44.35	26.9	31.09	32.63
27.9	49.43	35.85	27.9	46.01	24.61	27.9	16.50	13.06	27.9	17.81	43.96	27.9	31.19	32.35
28.9	49.60	35.70	28.9	46.32	24.24	28.9	16.62	12.81	28.9	17.88	43.57	28.9	31.28	32.07
29.9	49.77	35.55	29.9	46.65	23.87	29.9	16.74	12.56	29.9	17.96	43.17	29.9	31.38	31.80
30.9	49.95	35.37	30.9	47.03	23.51	30.9	16.85	12.31	30.9	18.05	42.78	30.9	31.47	31.53
31.8	50.12	35.20	31.9	47.42	23.16	31.9	16.96	12.04	31.9	18.14	42.40	31.9	31.55	31.25
9.83		−9.78	30.83		+30.82	10.80		−10.76	9.33		+9.28	12.41		−12.37
10^h	59^m	$54^s.546$	12^h	14^m	$29^s.190$	12^h	46^m	$19^s.119$	12^h	48^m	$31^s.308$	13^h	27^m	$32^s.891$
−84°	9′	29″.33	+88°	8′	56″.19	−84°	41′	1″.57	+83°	51′	11″.30	−85°	22′	19″.48

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. **Mag. 4.1**			**Groombridge 2283.** **Mag. 7.2**			**ρ Octantis.** **Mag. 5.7**			**ε Ursæ Minoris.** **Mag. 4.4**			**59 G. Apodis.** **Mag. 5.9**		
Wash. Mean Time.	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	14 13	−83 18	Oct.	15 2	+87 32	Oct.	15 24	−84 12	Oct.	16 53	+82 10	Oct.	17 16	−80 47
	s	″		s	″		s	″		s	″		s	″
1.1	48.34	16.33	1.1	14.56	43.20	1.1	29.90	16.77	1.2	62.07	37.90	1.2	26.52	30.04
2.1	48.28	16.07	2.1	14.18	42.88	2.1	29.77	16.56	2.2	61.90	37.73	2.2	26.41	29.94
3.1	48.21	15.80	3.1	13.81	42.55	3.1	29.64	16.34	3.2	61.72	37.55	3.2	26.30	29.85
4.1	48.13	15.52	4.1	13.47	42.22	4.1	29.50	16.12	4.2	61.57	37.37	4.2	26.18	29.77
5.1	48.05	15.25	5.1	13.14	41.90	5.1	29.37	15.90	5.2	61.41	37.19	5.2	26.07	29.67
6.1	47.99	14.94	6.1	12.83	41.59	6.1	29.22	15.66	6.2	61.26	37.01	6.2	25.94	29.57
7.1	47.92	14.63	7.1	12.53	41.29	7.1	29.07	15.40	7.2	61.10	36.82	7.2	25.80	29.44
8.0	47.86	14.30	8.1	12.21	41.02	8.1	28.94	15.12	8.2	60.95	36.67	8.2	25.67	29.29
9.0	47.81	13.97	9.1	11.88	40.74	9.1	28.83	14.81	9.2	60.80	36.53	9.2	25.55	29.11
10.0	47.78	13.64	10.1	11.51	40.46	10.1	28.72	14.50	10.2	60.63	36.39	10.2	25.44	28.91
11.0	47.77	13.30	11.1	11.14	40.17	11.1	28.64	14.21	11.2	60.46	36.25	11.2	25.34	28.71
12.0	47.76	12.99	12.1	10.75	39.85	12.1	28.58	13.92	12.1	60.29	36.07	12.2	25.24	28.52
13.0	47.76	12.71	13.1	10.38	39.54	13.1	28.52	13.65	13.1	60.11	35.89	13.2	25.15	28.34
14.0	47.76	12.45	14.1	10.02	39.20	14.1	28.46	13.40	14.1	59.95	35.69	14.2	25.08	28.17
15.0	47.76	12.18	15.1	9.70	38.83	15.1	28.39	13.16	15.1	59.78	35.46	15.2	25.00	28.02
16.0	47.73	11.91	16.1	9.42	38.44	16.1	28.31	12.92	16.1	59.63	35.23	16.2	24.91	27.88
17.0	47.70	11.64	17.1	9.17	38.06	17.1	28.22	12.67	17.1	59.48	34.96	17.1	24.82	27.74
18.0	47.67	11.34	18.1	8.94	37.72	18.1	28.12	12.40	18.1	59.34	34.71	18.1	24.71	27.58
19.0	47.64	11.01	19.1	8.74	37.39	19.1	28.03	12.11	19.1	59.22	34.47	19.1	24.60	27.40
20.0	47.60	10.68	20.0	8.52	37.06	20.1	27.92	11.79	20.1	59.08	34.24	20.1	24.48	27.21
21.0	47.59	10.34	21.0	8.29	36.74	21.1	27.83	11.48	21.1	58.94	34.03	21.1	24.37	26.99
22.0	47.60	10.00	22.0	8.06	36.43	22.1	27.77	11.15	22.1	58.81	33.83	22.1	24.26	26.75
23.0	47.61	9.65	23.0	7.81	36.12	23.1	27.70	10.81	23.1	58.67	33.64	23.1	24.16	26.51
24.0	47.63	9.30	24.0	7.54	35.80	24.1	27.66	10.47	24.1	58.53	33.44	24.1	24.07	26.26
25.0	47.66	8.97	25.0	7.28	35.48	25.1	27.62	10.14	25.1	58.39	33.22	25.1	23.98	26.00
25.9	47.69	8.65	26.0	7.03	35.14	26.0	27.58	9.81	26.1	58.25	32.99	26.1	23.90	25.76
26.9	47.72	8.33	27.0	6.79	34.78	27.0	27.57	9.50	27.1	58.11	32.74	27.1	23.84	25.52
27.9	47.77	8.04	28.0	6.56	34.42	28.0	27.55	9.21	28.1	57.97	32.47	28.1	23.78	25.28
28.9	47.81	7.75	29.0	6.37	34.05	29.0	27.53	8.92	29.1	57.84	32.20	29.1	23.71	25.04
29.9	47.84	7.47	30.0	6.18	33.67	30.0	27.50	8.64	30.1	57.71	31.92	30.1	23.64	24.83
30.9	47.87	7.19	31.0	6.03	33.28	31.0	27.47	8.37	31.1	57.58	31.60	31.1	23.57	24.63
31.9	47.88	6.90	32.0	5.90	32.89	32.0	27.44	8.08	32.1	57.47	31.31	32.1	23.49	24.40
	8.58	−8.52		23.34	+23.32		9.90	−9.85		7.35	+7.28		6.25	−6.17
14^{h}	13^{m}	$46^{s}.350$	15^{h}	3^{m}	$2^{s}.510$	15^{h}	24^{m}	$23^{s}.351$	16^{h}	54^{m}	$12^{s}.991$	17^{h}	16^{m}	$17^{s}.234$
−83°	17′	54″.52	+87°	32′	42″.66	−84°	11′	55″.43	+82°	10′	21″.42	−80°	47′	14″.27

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. **Mag. 4.4**			**χ Octantis.** **Mag. 5.2**			**λ Ursæ Minoris.** **Mag. 6.6**			**σ Octantis.** **Mag. 5.5**			**76 Draconis.** **Mag. 5.7**		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	17 57	+86 37	Oct.	18 7	−87 40	Oct.	18 58	+89 1	Oct.	19 31	−89 13	Oct.	20 48	+82 14
	s	″		s	″		s	″		s	″		s	″
1.2	58.89	14.44	1.2	56.51	4.15	1.3	72.91	41.33	1.3	101.89	19.28	1.3	34.45	30.62
2.2	58.44	14.39	2.2	56.04	4.11	2.3	71.33	41.38	2.3	100.50	19.35	2.3	34.29	30.85
3.2	58.00	14.33	3.2	55.57	4.09	3.3	69.77	41.42	3.3	99.11	19.43	3.3	34.14	31.06
4.2	57.57	14.24	4.2	55.07	4.08	4.3	68.23	41.43	4.3	97.67	19.52	4.3	33.98	31.26
5.2	57.15	14.16	5.2	54.55	4.04	5.3	66.73	41.45	5.3	96.16	19.60	5.3	33.82	31.44
6.2	56.75	14.06	6.2	54.01	4.00	6.3	65.28	41.45	6.3	94.58	19.67	6.3	33.66	31.62
7.2	56.36	13.98	7.2	53.46	3.95	7.2	63.90	41.48	7.3	92.91	19.72	7.3	33.52	31.80
8.2	55.97	13.92	8.2	52.91	3.86	8.2	62.51	41.51	8.3	91.20	19.77	8.3	33.37	31.98
9.2	55.57	13.87	9.2	52.36	3.74	9.2	61.14	41.55	9.3	89.48	19.78	9.3	33.23	32.18
10.2	55.16	13.84	10.2	51.84	3.60	10.2	59.73	41.62	10.3	87.79	19.78	10.3	33.09	32.41
11.2	54.74	13.80	11.2	51.36	3.46	11.2	58.25	41.68	11.3	86.18	19.74	11.3	32.94	32.63
12.2	54.31	13.74	12.2	50.92	3.32	12.2	56.70	41.74	12.3	84.66	19.70	12.3	32.79	32.86
13.2	53.85	13.66	13.2	50.49	3.20	13.2	55.09	41.79	13.3	83.24	19.67	13.3	32.62	33.08
14.2	53.39	13.57	14.2	50.09	3.07	14.2	53.44	41.79	14.3	81.88	19.66	14.3	32.45	33.28
15.2	52.95	13.45	15.2	49.69	2.96	15.2	51.78	41.79	15.2	80.54	19.64	15.3	32.28	33.46
16.2	52.52	13.31	16.2	49.26	2.86	16.2	50.17	41.75	16.2	79.14	19.63	16.3	32.10	33.60
17.2	52.10	13.16	17.2	48.80	2.77	17.2	48.62	41.70	17.2	77.67	19.64	17.3	31.93	33.74
18.2	51.72	13.01	18.2	48.32	2.67	18.2	47.15	41.65	18.2	76.11	19.65	18.3	31.76	33.84
19.2	51.34	12.86	19.2	47.81	2.55	19.2	45.73	41.60	19.2	74.45	19.66	19.3	31.58	33.94
20.2	50.97	12.73	20.2	47.29	2.42	20.2	44.38	41.55	20.2	72.73	19.64	20.3	31.43	34.05
21.2	50.61	12.60	21.2	46.77	2.26	21.2	43.04	41.51	21.2	70.98	19.60	21.3	31.27	34.18
22.2	50.25	12.49	22.2	46.26	2.08	22.2	41.70	41.47	22.2	69.24	19.52	22.3	31.12	34.30
23.2	49.88	12.38	23.2	45.78	1.88	23.2	40.34	41.46	23.2	67.53	19.42	23.3	30.98	34.43
24.2	49.50	12.27	24.2	45.32	1.67	24.2	38.94	41.44	24.2	65.88	19.32	24.3	30.82	34.57
25.2	49.11	12.14	25.2	44.90	1.45	25.2	37.50	41.41	25.2	64.30	19.22	25.3	30.65	34.72
26.2	48.72	12.02	26.2	44.48	1.24	26.2	36.01	41.38	26.2	62.78	19.13	26.3	30.48	34.87
27.2	48.31	11.87	27.2	44.10	1.04	27.2	34.51	41.33	27.2	61.32	19.04	27.3	30.31	35.00
28.1	47.92	11.69	28.2	43.72	0.85	28.2	32.99	41.28	28.2	59.90	18.95	28.3	30.14	35.10
29.1	47.53	11.51	29.2	43.35	0.66	29.2	31.46	41.20	29.2	58.50	18.87	29.3	29.96	35.19
30.1	47.14	11.33	30.2	42.99	0.48	30.2	29.95	41.11	30.2	57.12	18.78	30.3	29.78	35.28
31.1	46.77	11.13	31.1	42.61	0.31	31.2	28.47	41.00	31.2	55.74	18.70	31.3	29.59	35.35
32.1	46.41	10.90	32.1	42.22	0.12	32.2	27.02	40.87	32.2	54.30	18.62	32.3	29.41	35.40
	16.96	+16.93		24.57	−24.55		58.97	+58.96		73.66	−73.65		7.41	+7.34
17^h 58^m $22^s.311$			18^h 7^m $23^s.343$			19^h 0^m $15^s.079$			19^h 30^m $50^s.769$			20^h 48^m $32^s.146$		
+86° 36′ 51″.04			−87° 39′ 50″.89			+89° 1′ 12″.80			−89° 13′ 13″.35			+82° 13′ 56″.82		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			**ν Octantis. Mag. 5.7**			**β Octantis. Mag. 4.3**			**39 H. Cephei. Mag. 5.6**			**γ^1 Octantis. Mag. 5.1**		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	21 38	−83 5	Oct.	22 16	−86 22	Oct.	22 38	−81 48	Oct.	23 28	+86 52	Oct.	23 47	−82 27
	s	″		s	″		s	″		s	″		s	″
1.4	53.83	26.85	1.4	57.97	40.42	1.4	3.87	11.76	1.5	10.67	5.57	1.5	34.46	50.27
2.4	53.72	27.07	2.4	57.80	40.67	2.4	3.81	12.02	2.4	10.54	5.96	2.5	34.44	50.56
3.4	53.62	27.29	3.4	57.63	40.92	3.4	3.76	12.28	3.4	10.40	6.34	3.5	34.43	50.86
4.4	53.51	27.53	4.4	57.47	41.18	4.4	3.69	12.56	4.4	10.25	6.71	4.5	34.40	51.16
5.4	53.38	27.76	5.4	57.29	41.44	5.4	3.63	12.84	5.4	10.09	7.05	5.5	34.38	51.48
6.4	53.26	28.00	6.4	57.09	41.71	6.4	3.55	13.12	6.4	9.94	7.39	6.5	34.34	51.79
7.4	53.12	28.23	7.4	56.86	41.97	7.4	3.46	13.41	7.4	9.79	7.73	7.4	34.29	52.12
8.4	52.98	28.45	8.4	56.62	42.23	8.4	3.36	13.70	8.4	9.67	8.07	8.4	34.23	52.46
9.4	52.82	28.64	9.4	56.34	42.47	9.4	3.25	13.96	9.4	9.57	8.43	9.4	34.15	52.77
10.4	52.66	28.82	10.4	56.06	42.69	10.4	3.14	14.19	10.4	9.47	8.79	10.4	34.07	53.07
11.3	52.50	28.96	11.4	55.79	42.89	11.4	3.04	14.41	11.4	9.37	9.16	11.4	33.99	53.35
12.3	52.35	29.10	12.4	55.53	43.07	12.4	2.94	14.61	12.4	9.25	9.54	12.4	33.92	53.63
13.3	52.21	29.22	13.4	55.29	43.24	13.4	2.84	14.80	13.4	9.11	9.93	13.4	33.86	53.87
14.3	52.08	29.35	14.4	55.06	43.41	14.4	2.75	15.00	14.4	8.93	10.33	14.4	33.80	54.11
15.3	51.96	29.48	15.4	54.84	43.60	15.4	2.67	15.20	15.4	8.74	10.71	15.4	33.74	54.38
16.3	51.84	29.66	16.4	54.63	43.80	16.4	2.60	15.43	16.4	8.51	11.06	16.4	33.69	54.65
17.3	51.70	29.83	17.4	54.40	44.01	17.4	2.51	15.66	17.4	8.28	11.40	17.4	33.63	54.94
18.3	51.56	30.00	18.4	54.16	44.23	18.4	2.41	15.90	18.4	8.04	11.72	18.4	33.57	55.23
19.3	51.39	30.19	19.4	53.89	44.46	19.4	2.29	16.15	19.4	7.81	12.02	19.4	33.49	55.53
20.3	51.23	30.37	20.3	53.60	44.69	20.4	2.17	16.39	20.4	7.61	12.33	20.4	33.41	55.84
21.3	51.05	30.52	21.3	53.28	44.90	21.4	2.05	16.64	21.4	7.42	12.63	21.4	33.31	56.15
22.3	50.87	30.66	22.3	52.95	45.09	22.4	1.91	16.85	22.4	7.24	12.94	22.4	33.20	56.44
23.3	50.69	30.78	23.3	52.62	45.27	23.4	1.77	17.04	23.4	7.05	13.26	23.4	33.08	56.71
24.3	50.50	30.88	24.3	52.30	45.41	24.4	1.64	17.23	24.4	6.87	13.58	24.4	32.97	56.98
25.3	50.33	30.97	25.3	51.98	45.55	25.4	1.52	17.40	25.4	6.69	13.90	25.4	32.86	57.24
26.3	50.16	31.04	26.3	51.66	45.68	26.3	1.39	17.55	26.4	6.47	14.21	26.4	32.75	57.48
27.3	49.99	31.12	27.3	51.37	45.80	27.3	1.26	17.70	27.4	6.25	14.54	27.4	32.65	57.71
28.3	49.84	31.20	28.3	51.07	45.92	28.3	1.15	17.85	28.4	6.01	14.87	28.4	32.54	57.93
29.3	49.69	31.28	29.3	50.79	46.04	29.3	1.03	18.01	29.4	5.74	15.20	29.4	32.44	58.15
30.3	49.54	31.36	30.3	50.51	46.16	30.3	0.91	18.16	30.4	5.47	15.52	30.4	32.35	58.38
31.3	49.39	31.45	31.3	50.24	46.29	31.3	0.80	18.33	31.4	5.17	15.83	31.4	32.26	58.60
32.3	49.24	31.53	32.3	49.95	46.41	32.3	0,68	18.50	32.4	4.87	16.11	32.4	32.16	58.83
8.31		−8.25	15.83		−15.80	7.02		−6.94	18.31		+18.29	7.63		−7.56
21^{h} 38^{m} $38^{s}.548$			22^{h} 16^{m} $33^{s}.212$			22^{h} 37^{m} $51^{s}.624$			23^{h} 27^{m} $43^{s}.571$			23^{h} 47^{m} $23^{s}.637$		
−83° 5′ 34″.33			−86° 22′ 50″.92			−81° 48′ 24″.80			+86° 51′ 38″.62			−82° 28′ 8″.42		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. **Mag. 4.5**			**α Ursæ Minoris.** **(*Polaris.*)** **Mag. 2.1**			**4 G. Octantis.** **Mag. 5.6**			**Groombridge 750.** **Mag. 6.7**			**Groombridge 944.** **Mag. 6.4**		
Wash. Mean Time.	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	0 57	+85 49	Nov.	1 32	+88 52	Nov.	1 41	−85 10	Nov.	4 11	+85 20	Nov.	5 36	+85 9
	s	″		s	″		s	″		s	″		s	″
0.4	53.53	52.96	0.5	63.14	44.58	0.5	62.09	31.94	0.6	13.76	27.58	0.6	22.35	18.94
1.4	53.43	53.31	1.5	62.92	44.95	1.5	62.03	32.26	1.6	13.91	27.91	1.6	22.59	19.17
2.4	53.32	53.65	2.4	62.68	45.32	2.5	61.98	32.57	2.6	14.06	28.22	2.6	22.82	19.40
3.4	53.21	53.98	3.4	62.44	45.66	3.5	61.91	32.90	3.6	14.20	28.52	3.6	23.02	19.63
4.4	53.10	54.30	4.4	62.25	45.99	4.5	61.82	33.22	4.6	14.34	28.81	4.6	23.24	19.82
5.4	53.02	54.62	5.4	62.10	46.31	5.4	61.72	33.56	5.6	14.49	29.09	5.6	23.46	20.02
6.4	52.96	54.94	6.4	62.00	46.65	6.4	61.59	33.89	6.5	14.66	29.35	6.6	23.69	20.20
7.4	52.90	55.27	7.4	61.92	47.01	7.4	61.46	34.21	7.5	14.83	29.62	7.6	23.93	20.38
8.4	52.84	55.63	8.4	61.85	47.39	8.4	61.32	34.49	8.5	15.03	29.93	8.6	24.19	20.57
9.4	52.76	56.00	9.4	61.74	47.78	9.4	61.18	34.77	9.5	15.22	30.24	9.6	24.46	20.80
10.4	52.66	56.37	10.4	61.57	48.18	10.4	61.04	35.05	10.5	15.40	30.57	10.6	24.72	21.03
11.4	52.54	56.74	11.4	61.30	48.57	11.4	60.94	35.27	11.5	15.58	30.94	11.6	24.97	21.29
12.4	52.41	57.11	12.4	60.93	48.96	12.4	60.82	35.52	12.5	15.72	31.29	12.6	25.21	21.56
13.4	52.24	57.44	13.4	60.50	49.33	13.4	60.72	35.79	13.5	15.84	31.65	13.6	25.42	21.84
14.4	52.07	57.77	14.4	60.03	49.67	14.4	60.61	36.07	14.5	15.95	32.01	14.6	25.62	22.13
15.4	51.90	58.07	15.4	59.55	50.00	15.4	60.48	36.36	15.5	16.04	32.35	15.6	25.81	22.40
16.4	51.75	58.35	16.4	59.09	50.32	16.4	60.36	36.67	16.5	16.12	32.68	16.6	25.97	22.67
17.4	51.59	58.62	17.4	58.67	50.64	17.4	60.21	36.98	17.5	16.20	32.98	17.6	26.14	22.92
18.4	51.46	58.89	18.4	58.29	50.94	18.4	60.06	37.27	18.5	16.29	33.27	18.6	26.31	23.16
19.4	51.32	59.16	19.4	57.92	51.25	19.4	59.88	37.57	19.5	16.38	33.57	19.6	26.48	23.39
20.4	51.18	59.44	20.4	57.56	51.56	20.4	59.70	37.86	20.5	16.48	33.86	20.6	26.66	23.62
21.4	51.04	59.73	21.4	57.19	51.88	21.4	59.51	38.13	21.5	16.59	34.17	21.6	26.85	23.86
22.4	50.91	60.03	22.4	56.82	52.20	22.4	59.32	38.37	22.5	16.70	34.49	22.6	27.04	24.11
23.4	50.76	60.32	23.4	56.40	52.52	23.4	59.14	38.61	23.5	16.81	34.82	23.6	27.24	24.38
24.4	50.59	60.62	24.4	55.91	52.85	24.4	58.96	38.83	24.5	16.91	35.16	24.6	27.43	24.66
25.4	50.41	60.93	25.4	55.38	53.18	25.4	58.78	39.05	25.5	17.01	35.51	25.6	27.62	24.94
26.4	50.22	61.23	26.4	54.79	53.52	26.4	58.60	39.25	26.5	17.07	35.87	26.6	27.79	25.23
27.4	50.02	61.51	27.4	54.16	53.85	27.4	58.43	39.46	27.5	17.13	36.25	27.5	27.95	25.55
28.4	49.79	61.79	28.4	53.48	54.16	28.4	58.26	39.68	28.5	17.18	36.61	28.5	28.10	25.87
29.4	49.57	62.04	29.4	52.77	54.45	29.4	58.10	39.91	29.5	17.21	36.95	29.5	28.24	26.19
30.3	49.34	62.28	30.4	52.05	54.74	30.4	57.92	40.14	30.5	17.22	37.29	30.5	28.35	26.50
31.3	49.13	62.51	31.4	51.36	55.00	31.4	57.78	40.39	31.5	17.24	37.61	31.5	28.46	26.80
	13.76	+13.73		51.19	+51.18		11.89	−11.85		12.31	+12.27		11.84	+11.80
$0^h\ 57^m\ 24^s.633$			$1^h\ 31^m\ 11^s.709$			$1^h\ 41^m\ 54^s.846$			$4^h\ 10^m\ 37^s.831$			$5^h\ 35^m\ 50^s.330$		
+85° 49′ 24″.14			+88° 52′ 20″.55			−85° 10′ 45″.22			+85° 20′ 28″.88			+85° 9′ 34″.51		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			**ζ Mensæ.** Mag. 5.6			**51 H. Cephei.** Mag. 5.3			**25 H. Camelop.** Mag. 5.1			**7 G. Octantis.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	5 45	−84 49	Nov.	6 46	−80 43	Nov.	7 3	+87 10	Nov.	7 14	+82 33	Nov.	7 15	−86 54
	s	″		s	″		s	″		s	″		s	″
0.6	48.37	33.30	0.7	47.52	37.56	0.7	43.17	15.66	0.7	24.80	48.48	0.7	28.27	13.16
1.6	48.54	33.53	1.7	47.64	37.72	1.7	43.66	15.76	1.7	25.00	48.56	1.7	28.63	13.29
2.6	48.71	33.76	2.7	47.76	37.88	2.7	44.14	15.87	2.7	25.18	48.65	2.7	29.00	13.42
3.6	48.89	34.00	3.7	47.89	38.07	3.7	44.60	15.98	3.7	25.36	48.73	3.7	29.39	13.56
4.6	49.07	34.27	4.7	48.01	38.29	4.7	45.03	16.08	4.7	25.53	48.79	4.7	29.79	13.72
5.6	49.24	34.55	5.7	48.13	38.51	5.7	45.48	16.17	5.7	25.70	48.85	5.7	30.18	13.90
6.6	49.39	34.87	6.7	48.26	38.74	6.7	45.93	16.22	6.7	25.89	48.89	6.7	30.56	14.11
7.6	49.53	35.18	7.7	48.36	39.02	7.7	46.40	16.29	7.7	26.07	48.93	7.7	30.91	14.34
8.6	49.66	35.49	8.6	48.47	39.30	8.7	46.91	16.37	8.7	26.27	48.96	8.7	31.24	14.57
9.6	49.77	35.81	9.6	48.57	39.54	9.7	47.44	16.45	9.7	26.48	49.01	9.7	31.55	14.79
10.6	49.88	36.10	10.6	48.67	39.78	10.7	47.99	16.54	10.7	26.71	49.10	10.7	31.84	15.00
11.6	49.99	36.38	11.6	48.77	40.02	11.7	48.52	16.67	11.7	26.92	49.23	11.7	32.13	15.20
12.6	50.10	36.62	12.6	48.86	40.25	12.7	49.03	16.83	12.7	27.12	49.35	12.7	32.41	15.39
13.6	50.23	36.89	13.6	48.95	40.47	13.6	49.52	17.01	13.7	27.32	49.50	13.7	32.72	15.56
14.6	50.36	37.15	14.6	49.05	40.69	14.6	49.97	17.20	14.7	27.50	49.65	14.7	33.03	15.74
15.6	50.50	37.43	15.6	49.16	40.92	15.6	50.40	17.37	15.7	27.67	49.80	15.7	33.35	15.94
16.6	50.63	37.74	16.6	49.26	41.18	16.6	50.79	17.54	16.6	27.82	49.95	16.6	33.69	16.14
17.6	50.76	38.05	17.6	49.37	41.44	17.6	51.17	17.69	17.6	27.98	50.08	17.6	34.05	16.37
18.6	50.87	38.38	18.6	49.47	41.73	18.6	51.56	17.84	18.6	28.13	50.20	18.6	34.39	16.61
19.6	50.98	38.72	19.6	49.57	42.05	19.6	51.97	17.98	19.6	28.28	50.32	19.6	34.71	16.89
20.6	51.08	39.08	20.6	49.66	42.37	20.6	52.37	18.12	20.6	28.46	50.43	20.6	35.01	17.17
21.6	51.17	39.44	21.6	49.76	42.69	21.6	52.79	18.26	21.6	28.63	50.54	21.6	35.30	17.45
22.6	51.23	39.79	22.6	49.85	43.00	22.6	53.23	18.41	22.6	28.80	50.67	22.6	35.58	17.74
23.6	51.30	40.12	23.6	49.92	43.32	23.6	53.67	18.58	23.6	28.98	50.80	23.6	35.83	18.02
24.6	51.37	40.45	24.6	50.00	43.64	24.6	54.12	18.75	24.6	29.16	50.95	24.6	36.07	18.30
25.6	51.44	40.78	25.6	50.06	43.92	25.6	54.56	18.95	25.6	29.34	51.13	25.6	36.30	18.56
26.6	51.50	41.10	26.6	50.13	44.22	26.6	54.99	19.17	26.6	29.53	51.31	26.6	36.53	18.81
27.6	51.55	41.41	27.6	50.20	44.51	27.6	55.41	19.40	27.6	29.70	51.51	27.6	36.76	19.06
28.6	51.62	41.72	28.6	50.27	44.79	28.6	55.79	19.63	28.6	29.85	51.71	28.6	36.98	19.32
29.6	51.68	42.03	29.6	50.35	45.07	29.6	56.17	19.86	29.6	30.00	51.92	29.6	37.22	19.57
30.5	51.75	42.35	30.6	50.43	45.38	30.6	56.51	20.10	30.6	30.15	52.13	30.6	37.46	19.84
31.5	51.82	42.67	31.6	50.49	45.69	31.6	56.83	20.34	31.6	30.28	52.34	31.6	37.71	20.12
	11.09	−11.05		6.21	−6.13		20.26	+20.24		7.73	+7.66		18.52	−18.49
$5^h\ 45^m\ 51^s.396$			$6^h\ 46^m\ 48^s.653$			$7^h\ 3^m\ 2^s.335$			$7^h\ 14^m\ 7^s.912$			$7^h\ 15^m\ 39^s.691$		
−84° 49′ 44″.27			−80° 43′ 46″.14			+87° 10′ 43″.86			+82° 34′ 17″.32			−86° 54′ 19″.75		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	8 18	+88 52	Nov.	9 8	−85 20	Nov.	9 25	+81 40	Nov.	9 36	−80 34	Nov.	10 21	+82 57
	s	″		s	″		s	″		s	″		s	″
0.7	48.99	2.03	0.8	33.82	26.49	0.8	45.37	31.90	0.8	16.99	40.26	0.8	21.30	38.92
1.7	50.28	2.02	1.8	34.08	26.45	1.8	45.54	31.77	1.8	17.11	40.19	1.8	21.48	38.73
2.7	51.52	2.01	2.8	34.35	26.41	2.8	45.69	31.65	2.8	17.24	40.12	2.8	21.66	38.54
3.7	52.70	2.00	3.8	34.62	26.40	3.8	45.85	31.53	3.8	17.37	40.06	3.8	21.82	38.34
4.7	53.83	2.00	4.8	34.91	26.40	4.8	46.01	31.39	4.8	17.52	40.02	4.8	21.98	38.15
5.7	54.96	1.97	5.8	35.20	26.42	5.8	46.15	31.26	5.8	17.67	40.01	5.8	22.13	37.95
6.7	56.12	1.94	6.8	35.52	26.47	6.8	46.30	31.12	6.8	17.82	40.04	6.8	22.29	37.72
7.7	57.32	1.88	7.8	35.82	26.53	7.8	46.46	30.97	7.8	17.97	40.07	7.8	22.44	37.50
8.7	58.58	1.82	8.7	36.10	26.61	8.8	46.63	30.80	8.8	18.13	40.12	8.8	22.62	37.27
9.7	59.92	1.78	9.7	36.38	26.69	9.8	46.81	30.63	9.8	18.28	40.19	9.8	22.81	37.02
10.7	61.30	1.77	10.7	36.62	26.78	10.8	47.00	30.48	10.8	18.42	40.26	10.8	23.00	36.78
11.7	62.69	1.77	11.7	36.87	26.85	11.8	47.20	30.35	11.8	18.55	40.30	11.8	23.23	36.57
12.7	64.06	1.82	12.7	37.11	26.90	12.8	47.39	30.25	12.8	18.68	40.34	12.8	23.43	36.38
13.7	65.39	1.88	13.7	37.36	26.95	13.7	47.58	30.18	13.8	18.81	40.35	13.8	23.63	36.23
14.7	66.65	1.94	14.7	37.62	26.99	14.7	47.76	30.12	14.8	18.94	40.37	14.8	23.83	36.09
15.7	67.83	2.00	15.7	37.89	27.03	15.7	47.94	30.07	15.7	19.07	40.40	15.8	24.02	35.96
16.7	68.95	2.07	16.7	38.17	27.08	16.7	48.09	30.02	16.7	19.21	40.43	16.8	24.19	35.83
17.7	70.03	2.14	17.7	38.46	27.18	17.7	48.24	29.98	17.7	19.37	40.48	17.8	24.36	35.71
18.7	71.11	2.19	18.7	38.75	27.27	18.7	48.40	29.92	18.7	19.52	40.54	18.8	24.53	35.57
19.7	72.19	2.23	19.7	39.05	27.40	19.7	48.55	29.86	19.7	19.67	40.62	19.8	24.71	35.43
20.7	73.31	2.27	20.7	39.34	27.53	20.7	48.70	29.79	20.7	19.82	40.71	20.8	24.88	35.29
21.7	74.46	2.32	21.7	39.61	27.69	21.7	48.87	29.71	21.7	19.97	40.83	21.8	25.06	35.15
22.7	75.65	2.36	22.7	39.89	27.85	22.7	49.05	29.63	22.7	20.12	40.96	22.8	25.24	34.99
23.7	76.86	2.42	23.7	40.14	27.99	23.7	49.22	29.57	23.7	20.26	41.09	23.8	25.45	34.85
24.7	78.10	2.50	24.7	40.39	28.14	24.7	49.40	29.53	24.7	20.40	41.22	24.8	25.65	34.72
25.7	79.35	2.58	25.7	40.64	28.30	25.7	49.59	29.49	25.7	20.53	41.35	25.8	25.85	34.60
26.7	80.60	2.68	26.7	40.87	28.45	26.7	49.78	29.47	26.7	20.66	41.49	26.8	26.06	34.49
27.7	81.82	2.80	27.7	41.11	28.60	27.7	49.97	29.46	27.7	20.79	41.60	27.7	26.28	34.39
28.7	83.00	2.93	28.7	41.34	28.75	28.7	50.15	29.48	28.7	20.91	41.71	28.7	26.50	34.34
29.7	84.13	3.07	29.7	41.58	28.88	29.7	50.32	29.51	29.7	21.04	41.82	29.7	26.70	34.28
30.7	85.19	3.21	30.7	41.83	29.02	30.7	50.47	29.54	30.7	21.18	41.94	30.7	26.88	34.23
31.7	86.20	3.35	31.7	42.09	29.19	31.7	50.63	29.57	31.7	21.31	42.08	31.7	27.07	34.18
	50.58	+50.57		12.31	−12.27		6.91	+6.83		6.11	−6.03		8.16	+8.10
8^{h} 17^{m} $47^{s}.546$			9^{h} 8^{m} $41^{s}.594$			9^{h} 25^{m} $39^{s}.275$			9^{h} 36^{m} $19^{s}.026$			10^{h} 21^{m} $19^{s}.949$		
+88° 52′ 37″.80			−85° 20′ 26″.78			+81° 41′ 10″.13			−80° 34′ 39″.26			+82° 58′ 17″.67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			**Bradley 1672.** Mag. 6.3			**ι Octantis.** Mag. 5.4			**32 H. Camelop.** *seq.* Mag. 5.3			**κ Octantis.** Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	10 59	−84 9	Nov.	12 13	+88 8	Nov.	12 46	−84 41	Nov.	12 48	+83 50	Nov.	13 27	−85 22
	s	″		s	″		s	″		s	″		s	″
0.8	50.12	35.20	0.9	47.42	23.16	0.9	16.96	12.04	0.9	18.14	42.40	0.9	31.55	31.25
1.8	50.29	35.03	1.9	47.82	22.83	1.9	17.06	11.78	1.9	18.24	42.04	1.9	31.63	30.96
2.8	50.47	34.86	2.9	48.21	22.52	2.9	17.19	11.50	2.9	18.32	41.70	2.9	31.72	30.65
3.8	50.65	34.68	3.9	48.59	22.23	3.9	17.32	11.22	3.9	18.41	41.37	3.9	31.82	30.34
4.8	50.86	34.51	4.9	48.93	21.93	4.9	17.46	10.93	4.9	18.48	41.04	4.9	31.94	30.01
5.8	51.08	34.38	5.9	49.25	21.62	5.9	17.63	10.65	5.9	18.56	40.71	5.9	32.08	29.70
6.8	51.30	34.24	6.9	49.54	21.30	6.9	17.80	10.41	6.9	18.62	40.37	6.9	32.25	29.41
7.8	51.54	34.14	7.9	49.84	20.96	7.9	18.00	10.18	7.9	18.68	40.04	7.9	32.43	29.14
8.8	51.76	34.08	8.9	50.16	20.62	8.9	18.19	9.97	8.9	18.76	39.66	8.9	32.62	28.88
9.8	51.98	34.02	9.9	50.53	20.25	9.9	18.39	9.76	9.9	18.85	39.28	9.9	32.80	28.64
10.8	52.18	33.96	10.9	50.95	19.91	10.9	18.57	9.57	10.9	18.95	38,89	10.9	32.98	28.43
11.8	52.38	33.90	11.9	51.42	19.56	11.9	18.75	9.40	11.9	19.07	38.50	11.9	33.14	28.21
12.8	52.57	33.81	12.9	51.93	19.23	12.9	18.89	9.22	12.9	19.20	38.14	12.9	33.28	27.98
13.8	52.76	33.73	13.9	52.46	18.93	13.9	19.04	9.02	13.9	19.34	37.80	13.9	33.42	27.74
14.8	52.96	33.63	14.9	52.99	18.65	14.9	19.21	8.79	14.9	19.47	37.47	14.9	33.56	27.50
15.8	53.17	33.53	15.9	53.49	18.39	15.9	19.38	8.56	15.9	19.60	37.16	15.9	33.71	27.22
16.8	53.39	33.43	16.9	53.96	18.15	16.9	19.55	8.33	16.9	19.73	36.87	16.9	33.88	26.95
17.8	53.61	33.34	17.9	54.40	17.90	17.9	19.74	8.11	17.9	19.83	36.59	17.9	34.06	26.68
18.8	53.84	33.27	18.9	54.83	17.63	18.9	19.94	7.88	18.9	19.94	36.30	18.9	34.25	26.40
19.8	54.08	33.22	19.8	55.26	17.37	19.9	20.17	7.67	19.9	20.05	36.01	19.9	34.48	26.15
20.8	54.33	33.19	20.8	55.70	17.11	20.9	20.39	7.47	20.9	20.16	35.71	20.9	34.70	25.90
21.8	54.58	33.18	21.8	56.15	16.83	21.9	20.62	7.31	21.9	20.28	35.42	21.9	34.93	25.68
22.8	54.81	33.18	22.8	56.61	16.55	22.9	20.85	7.16	22.9	20.41	35.10	22.9	35.16	25.48
23.8	55.05	33.19	23.8	57.12	16.27	23.9	21.07	7.01	23.9	20.55	34.77	23.9	35.39	25.28
24.8	55.28	33.20	24.8	57.66	16.00	24.9	21.29	6.87	24.9	20.69	34.45	24.9	35.62	25.09
25.8	55.50	33.20	25.8	58.22	15.75	25.9	21.51	6.74	25.9	20.84	34.14	25.9	35.82	24.92
26.8	55.69	33.21	26.8	58.82	15.50	26.9	21.71	6.61	26.9	21.01	33.83	26.9	36.03	24.74
27.8	55.90	33.22	27.8	59.43	15.25	27.8	21.92	6.48	27.8	21.18	33.54	27.9	36.24	24.57
28.8	56.11	33.22	28.8	60.06	15.03	28.8	22.11	6.34	28.8	21.35	33.26	28.9	36.44	24.39
29.8	56.33	33.21	29.8	60.68	14.83	29.8	22.31	6.19	29.8	21.53	33.01	29.9	36.65	24.19
30.8	56.55	33.21	30.8	61.29	14.62	30.8	22.53	6.05	30.8	21.69	32.76	30.9	36.87	23.99
31.8	56.78	33.21	31.8	61.85	14.43	31.8	22.75	5.90	31.8	21.84	32.52	31.9	37.10	23.79
9.83		−9.78	30.78		+30.77	10.80		−10.75	9.32		+9.27	12.40		−12.36
10^{h} 59^{m} $54^{s}.546$			12^{h} 14^{m} $29^{s}.190$			12^{h} 46^{m} $19^{s}.119$			12^{h} 48^{m} $31^{s}.308$			13^{h} 27^{m} $32^{s}.891$		
−84° 9′ 29″.33			+88° 8′ 56″.19			−84° 41′ 1″.57			+83° 51′ 11″.30			−85° 22′ 19″.48		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	14 13	−83 17	Nov.	15 2	+87 32	Nov.	15 24	−84 11	Nov.	16 53	+82 10	Nov.	17 16	−80 47
	s	″		s	″		s	″		s	″		s	″
0.9	47.88	66.90	1.0	5.90	32.89	1.0	27.44	68.08	1.1	57.47	31.31	1.1	23.49	24.40
1.9	47.91	66.59	2.0	5.80	32.53	2.0	27.40	67.78	2.1	57.36	31.01	2.1	23.41	24.17
2.9	47.94	66.28	3.0	5.70	32.17	3.0	27.36	67.46	3.1	57.25	30.72	3.1	23.33	23.93
3.9	47.97	65.96	4.0	5.60	31.83	4.0	27.33	67.12	4.1	57.15	30.45	4.1	23.25	23.67
4.9	48.01	65.64	5.0	5.47	31.49	5.0	27.32	66.78	5.1	57.04	30.18	5.1	23.17	23.39
5.9	48.07	65.30	6.0	5.33	31.15	6.0	27.32	66.44	6.1	56.93	29.92	6.1	23.11	23.09
6.9	48.15	64.97	6.9	5.18	30.83	7.0	27.35	66.09	7.1	56.82	29.67	7.1	23.05	22.77
7.9	48.25	64.65	7.9	5.00	30.48	8.0	27.38	65.76	8.1	56.69	29.42	8.1	23.00	22.48
8.9	48.35	64.37	8.9	4.84	30.11	9.0	27.43	65.44	9.1	56.57	29.15	9.1	22.97	22.19
9.9	48.45	64.10	9.9	4.69	29.74	10.0	27.49	65.14	10.1	56.46	28.85	10.1	22.95	21.90
10.9	48.55	63.85	10.9	4.57	29.33	11.0	27.54	64.85	11.1	56.35	28.53	11.1	22.92	21.63
11.9	48.64	63.61	11.9	4.48	28.92	12.0	27.58	64.59	12.1	56.24	28.19	12.1	22.90	21.39
12.9	48.70	63.38	12.9	4.44	28.52	12.9	27.61	64.31	13.1	56.14	27.85	13.1	22.86	21.14
13.9	48.77	63.11	13.9	4.43	28.13	13.9	27.63	64.04	14.1	56.06	27.50	14.1	22.82	20.89
14.9	48.84	62.85	14.9	4.44	27.74	14.9	27.64	63.74	15.1	55.98	27.15	15.1	22.78	20.63
15.9	48.90	62.56	15.9	4.45	27.40	15.9	27.65	63.42	16.1	55.91	26.82	16.1	22.72	20.35
16.9	48.99	62.25	16.9	4.47	27.05	16.9	27.68	63.08	17.0	55.83	26.52	17.1	22.67	20.06
17.9	49.08	61.93	17.9	4.47	26.72	17.9	27.71	62.74	18.0	55.77	26.23	18.1	22.62	19.74
18.9	49.19	61.62	18.9	4.46	26.40	18.9	27.76	62.39	19.0	55.69	25.93	19.1	22.58	19.41
19.9	49.32	61.33	19.9	4.43	26.07	19.9	27.84	62.04	20.0	55.61	25.64	20.1	22.55	19.07
20.9	49.44	61.04	20.9	4.40	25.73	20.9	27.92	61.71	21.0	55.54	25.35	21.1	22.54	18.74
21.9	49.56	60.77	21.9	4.39	25.38	21.9	28.00	61.39	22.0	55.46	25.03	22.1	22.52	18.42
22.9	49.70	60.53	22.9	4.38	25.01	22.9	28.10	61.10	23.0	55.38	24.71	23.0	22.51	18.10
23.9	49.83	60.29	23.9	4.39	24.65	23.9	28.20	60.80	24.0	55.31	24.38	24.0	22.51	17.79
24.9	49.96	60.06	24.9	4.42	24.27	24.9	28.29	60.51	25.0	55.24	24.02	25.0	22.52	17.50
25.9	50.10	59.83	25.9	4.47	23.90	25.9	28.39	60.24	26.0	55.18	23.65	26.0	22.52	17.22
26.9	50.22	59.64	26.9	4.55	23.51	26.9	28.48	59.97	27.0	55.13	23.28	27.0	22.51	16.94
27.9	50.35	59.41	27.9	4.65	23.12	27.9	28.57	59.71	28.0	55.08	22.90	28.0	22.51	16.67
28.9	50.47	59.19	28.9	4.78	22.75	28.9	28.65	59.44	29.0	55.04	22.52	29.0	22.50	16.40
29.9	50.59	58.97	29.9	4.92	22.39	29.9	28.72	59.16	30.0	55.00	22.15	30.0	22.49	16.11
30.9	50.71	58.73	30.9	5.07	22.06	30.9	28.81	58.87	31.0	54.97	21.82	31.0	22.48	15.79
31.9	50.83	58.48	31.9	5.20	21.73	31.9	28.90	58.56	32.0	54.94	21.48	32.0	22.47	15.46
8.57		−8.51	23.31		+23.29	9.90		−9.85	7.34		+7.28	6.25		−6.17
14^h	13^m	$46^s.350$	15^h	3^m	$2^s.510$	15^h	24^m	$23^s.351$	16^h	54^m	$12^s.991$	17^h	16^m	$17^s.234$
−83°	17′	54″.52	+87°	32′	42″.66	−84°	11′	55″.43	+82°	10′	21″.42	−80°	47′	14″.27

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursae Minoris. Mag. 4.4			**χ Octantis.** Mag. 5.2			**λ Ursae Minoris.** Mag. 6.6			**σ Octantis.** Mag. 5.5			**76 Draconis.** Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	17 57	+86 37	Nov.	18 7	−87 39	Nov.	18 57	+89 1	Nov.	19 31	−89 13	Nov.	20 48	+82 14
	s	″		s	″		s	″		s	″		s	″
1.1	46.41	10.90	1.1	42.22	60.12	1.2	87.02	40.87	1.2	54.30	18.62	1.3	29.41	35.40
2.1	46.07	10.68	2.1	41.81	59.93	2.2	85.64	40.73	2.2	52.81	18.53	2.3	29.24	35.45
3.1	45.74	10.46	3.1	41.39	59.74	3.2	84.32	40.60	3.2	51.24	18.42	3.3	29.07	35.48
4.1	45.42	10.26	4.1	40.96	59.51	4.2	83.05	40.50	4.2	49.65	18.30	4.2	28.90	35.51
5.1	45.10	10.07	5.1	40.54	59.25	5.2	81.79	40.40	5.2	48.04	18.16	5.2	28.75	35.56
6.1	44.78	9.90	6.1	40.15	58.98	6.2	80.51	40.30	6.2	46.47	17.98	6.2	28.59	35.62
7.1	44.44	9.73	7.1	39.80	58.70	7.2	79.19	40.25	7.2	44.98	17.79	7.2	28.43	35.70
8.1	44.08	9.56	8.1	39.49	58.41	8.2	77.81	40.17	8.2	43.59	17.58	8.2	28.26	35.79
9.1	43.72	9.39	9.1	39.23	58.12	9.2	76.37	40.08	9.2	42.34	17.39	9.2	28.09	35.85
10.1	43.34	9.17	10.1	38.99	57.87	10.2	74.88	39.97	10.2	41.17	17.20	10.2	27.91	35.91
11.1	42.98	8.93	11.1	38.77	57.63	11.2	73.37	39.83	11.2	40.05	17.01	11.2	27.73	35.96
12.1	42.63	8.66	12.1	38.54	57.40	12.1	71.90	39.66	12.2	38.93	16.84	12.2	27.55	35.98
13.1	42.30	8.39	13.1	38.27	57.17	13.1	70.51	39.48	13.2	37.77	16.69	13.2	27.36	35.97
14.1	42.00	8.11	14.1	37.98	56.93	14.1	69.19	39.29	14.2	36.52	16.53	14.2	27.18	35.94
15.1	41.72	7.83	15.1	37.66	56.69	15.1	67.96	39.09	15.2	35.18	16.38	15.2	27.00	35.90
16.1	41.45	7.57	16.1	37.33	56.41	16.1	66.81	38.90	16.2	33.79	16.20	16.2	26.83	35.86
17.1	41.21	7.32	17.1	37.00	56.13	17.1	65.69	38.73	17.2	32.37	16.01	17.2	26.68	35.82
18.1	40.95	7.09	18.1	36.70	55.84	18.1	64.59	38.58	18.2	30.95	15.79	18.2	26.52	35.80
19.1	40.69	6.87	19.1	36.41	55.52	19.1	63.49	38.43	19.2	29.58	15.55	19.2	26.37	35.79
20.1	40.42	6.65	20.1	36.15	55.20	20.1	62.37	38.28	20.2	28.27	15.32	20.2	26.21	35.76
21.1	40.16	6.42	21.1	35.91	54.88	21.1	61.21	38.11	21.1	27.04	15.07	21.2	26.06	35.74
22.1	39.88	6.18	22.1	35.71	54.56	22.1	60.02	37.94	22.1	25.89	14.80	22.2	25.89	35.73
23.1	39.61	5.92	23.1	35.54	54.24	23.1	58.81	37.77	23.1	24.83	14.55	23.2	25.72	35.72
24.1	39.34	5.64	24.1	35.39	53.93	24.1	57.59	37.58	24.1	23.82	14.30	24.2	25.56	35.68
25.1	39.06	5.36	25.1	35.24	53.63	25.1	56.37	37.36	25.1	22.86	14.06	25.2	25.39	35.63
26.1	38.79	5.05	26.1	35.11	53.34	26.1	55.17	37.14	26.1	21.93	13.82	26.2	25.21	35.54
27.1	38.55	4.74	27.1	34.97	53.06	27.1	54.00	36.90	27.1	21.00	13.58	27.2	25.04	35.46
28.1	38.32	4.43	28.1	34.82	52.78	28.1	52.87	36.65	28.1	20.07	13.35	28.2	24.87	35.36
29.1	38.11	4.11	29.1	34.64	52.50	29.1	51.82	36.40	29.1	19.10	13.11	29.2	24.70	35.25
30.1	37.91	3.79	30.1	34.47	52.21	30.1	50.83	36.15	30.1	18.07	12.87	30.2	24.55	35.12
31.1	37.73	3.48	31.1	34.29	51.89	31.1	49.90	35.90	31.1	17.00	12.61	31.2	24.39	34.99
32.1	37.55	3.19	32.1	34.11	51.57	32.1	49.02	35.66	32.1	15.92	12.33	32.2	24.24	34.88
	16.96	+16.93		24.55	−24.53		58.92	+58.91		73.57	−73.57		7.41	+7.34
$17^{\mathrm{h}}\ 58^{\mathrm{m}}\ 22^{\mathrm{s}}.311$			$18^{\mathrm{h}}\ 7^{\mathrm{m}}\ 23^{\mathrm{s}}.343$			$19^{\mathrm{h}}\ 0^{\mathrm{m}}\ 15^{\mathrm{s}}.079$			$19^{\mathrm{h}}\ 30^{\mathrm{m}}\ 50^{\mathrm{s}}.769$			$20^{\mathrm{h}}\ 48^{\mathrm{m}}\ 32^{\mathrm{s}}.146$		
+86° 36′ 51″.04			−87° 39′ 50″.89			+89° 1′ 12″.80			−89° 13′ 13″.35			+82° 13′ 56″.82		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	21 38	−83 5	Nov.	22 16	−86 22	Nov.	22 37	−81 48	Nov.	23 27	+86 52	Nov.	23 47	−82 27
	s	″		s	″		s	″		s	″		s	″
1.3	49.24	31.53	1.3	49.95	46.41	1.3	60.68	18.50	1.4	64.87	16.11	1.4	32.16	58.83
2.3	49.07	31.62	2.3	49.64	46.54	2.3	60.56	18.67	2.4	64.57	16.38	2.4	32.05	59.08
3.3	48.88	31.72	3.3	49.32	46.68	3.3	60.43	18.84	3.4	64.28	16.64	3.4	31.93	59.34
4.3	48.70	31.80	4.3	48.99	46.81	4.3	60.28	19.01	4.4	64.01	16.88	4.4	31.80	59.59
5.3	48.51	31.85	5.3	48.62	46.91	5.3	60.14	19.15	5.4	63.74	17.14	5.4	31.67	59.83
6.3	48.32	31.89	6.3	48.25	47.00	6.3	59.98	19.28	6.4	63.51	17.41	6.4	31.52	60.06
7.3	48.12	31.89	7.3	47.88	47.06	7.3	59.82	19.38	7.3	63.27	17.70	7.4	31.38	60.25
8.3	47.94	31.88	8.3	47.54	47.09	8.3	59.67	19.46	8.3	63.01	17.99	8.4	31.24	60.42
9.3	47.77	31.84	9.3	47.20	47.10	9.3	59.54	19.51	9.3	62.75	18.30	9.4	31.10	60.57
10.3	47.62	31.82	10.3	46.87	47.12	10.3	59.41	19.57	10.3	62.46	18.60	10.4	30.96	60.72
11.3	47.47	31.81	11.3	46.59	47.14	11.3	59.29	19.62	11.3	62.14	18.89	11.4	30.84	60.85
12.3	47.32	31.80	12.3	46.30	47.17	12.3	59.17	19.69	12.3	61.79	19.17	12.3	30.73	60.99
13.3	47.17	31.81	13.3	46.02	47.22	13.3	59.04	19.78	13.3	61.43	19.41	13.3	30.63	61.16
14.3	47.01	31.82	14.3	45.71	47.28	14.3	58.92	19.87	14.3	61.06	19.64	14.3	30.50	61.34
15.3	46.84	31.83	15.3	45.38	47.34	15.3	58.79	19.97	15.3	60.70	19.84	15.3	30.36	61.53
16.2	46.66	31.85	16.3	45.03	47.40	16.3	58.63	20.07	16.3	60.37	20.03	16.3	30.22	61.71
17.2	46.46	31.85	17.3	44.67	47.46	17.3	58.48	20.16	17.3	60.04	20.22	17.3	30.07	61.90
18.2	46.27	31.82	18.3	44.29	47.48	18.3	58.30	20.23	18.3	59.73	20.42	18.3	29.90	62.08
19.2	46.08	31.78	19.3	43.91	47.49	19.3	58.14	20.28	19.3	59.43	20.62	19.3	29.73	62.26
20.2	45.89	31.72	20.3	43.53	47.49	20.3	57.97	20.32	20.3	59.13	20.82	20.3	29.57	62.39
21.2	45.70	31.66	21.3	43.15	47.46	21.3	57.82	20.33	21.3	58.82	21.03	21.3	29.40	62.52
22.2	45.52	31.57	22.3	42.79	47.43	22.3	57.67	20.34	22.3	58.50	21.24	22.3	29.25	62.62
23.2	45.35	31.48	23.3	42.45	47.40	23.3	57.52	20.34	23.3	58.17	21.45	23.3	29.10	62.72
24.2	45.19	31.39	24.3	42.12	47.36	24.3	57.38	20.33	24.3	57.82	21.66	24.3	28.94	62.81
25.2	45.04	31.29	25.3	41.80	47.31	25.3	57.24	20.32	25.3	57.46	21.86	25.3	28.80	62.90
26.2	44.89	31.20	26.2	41.49	47.26	26.3	57.11	20.31	26.3	57.08	22.05	26.3	28.65	62.98
27.2	44.75	31.12	27.2	41.18	47.21	27.3	56.98	20.31	27.3	56.67	22.23	27.3	28.52	63.06
28.2	44.59	31.04	28.2	40.88	47.18	28.3	56.85	20.31	28.3	56.27	22.39	28.3	28.38	63.14
29.2	44.44	30.96	29.2	40.57	47.15	29.3	56.71	20.32	29.3	55.87	22.53	29.3	28.24	63.24
30.2	44.27	30.88	30.2	40.24	47.12	30.3	56.57	20.33	30.3	55.48	22.67	30.3	28.09	63.34
31.2	44.11	30.81	31.2	39.89	47.09	31.2	56.41	20.33	31.3	55.10	22.79	31.3	27.92	63.44
32.2	43.93	30.71	32.2	39.53	47.04	32.2	56.26	20.32	32.3	54.74	22.90	32.3	27.75	63.54
	8.31	−8.25		15.84	−15.80		7.02	−6.94		18.33	+18.30		7.63	−7.56
21^h	38^m	$38^s.548$	22^h	16^m	$33^s.212$	22^h	37^m	$51^s.624$	23^h	27^m	$43^s.571$	23^h	47^m	$23^s.637$
−83°	5′	34″.33	−86°	22′	50″.92	−81°	48′	24″.80	+86°	51′	38″.62	−82°	28′	8″.42

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**4 G. Octantis.** Mag. 5.6			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4		
Wash. Mean Time.	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**	**Wash. Mean Time.**	**Right Ascension.**	**Declination.**
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	0 57	+85 50	Dec.	1 32	+88 52	Dec.	1 41	−85 10	Dec.	4 11	+85 20	Dec.	5 36	+85 9
	s	″		s	″		s	″		s	″		s	″
0.3	49.34	2.28	0.4	52.05	54.74	0.4	57.92	40.14	0.5	17.22	37.29	0.5	28.35	26.50
1.3	49.13	2.51	1.4	51.36	55.00	1.4	57.73	40.39	1.5	17.24	37.61	1.5	28.46	26.80
2.3	48.93	2.73	2.4	50.72	55.26	2.4	57.52	40.63	2.5	17.27	37.92	2.5	28.57	27.08
3.3	48.74	2.94	3.4	50.13	55.54	3.4	57.29	40.86	3.5	17.30	38.22	3.5	28.69	27.35
4.3	48.56	3.16	4.4	49.57	55.77	4.4	57.06	41.07	4.5	17.34	38.51	4.5	28.82	27.61
5.3	48.39	3.40	5.4	49.02	56.04	5.4	56.81	41.27	5.5	17.39	38.83	5.5	28.96	27.87
6.3	48.21	3.66	6.4	48.47	56.33	6.4	56.56	41.43	6.5	17.46	39.15	6.5	29.11	28.15
7.3	48.02	3.93	7.4	47.87	56.65	7.4	56.32	41.58	7.5	17.53	39.49	7.5	29.26	28.43
8.3	47.81	4.18	8.4	47.18	56.96	8.4	56.09	41.71	8.5	17.58	39.85	8.5	29.41	28.76
9.3	47.57	4.43	9.3	46.41	57.27	9.4	55.89	41.84	9.5	17.59	40.22	9.5	29.56	29.10
10.3	47.31	4.68	10.3	45.55	57.56	10.4	55.67	41.98	10.5	17.60	40.58	10.5	29.67	29.45
11.3	47.04	4.90	11.3	44.66	57.82	11.4	55.48	42.13	11.5	17.58	40.95	11.5	29.77	29.80
12.3	46.77	5.09	12.3	43.73	58,06	12.3	55.27	42.31	12.5	17.54	41.28	12.5	29.83	30.15
13.3	46.50	5.26	13.3	42.82	58.27	13.3	55.05	42.48	13.4	17.49	41.62	13.5	29.89	30.48
14.3	46.25	5.41	14.3	41.95	58.46	14.3	54.82	42.65	14.4	17.44	41.92	14.5	29.94	30.77
15.3	46.01	5.56	15.3	41.11	58.66	15.3	54.58	42.82	15.4	17.40	42.22	15.5	29.99	31.07
16.3	45.77	5.70	16.3	40.32	58.86	16.3	54.31	42.99	16.4	17.35	42.50	16.5	30.03	31.36
17.3	45.54	5.85	17.3	39.54	59.05	17.3	54.05	43.14	17.4	17.32	42.79	17.5	30.08	31.64
18.3	45.31	6.01	18.3	38.76	59.25	18.3	53.78	43.28	18.4	17.29	43.07	18.5	30.14	31.93
19.3	45.09	6.17	19.3	37.98	59.46	19.3	53.51	43.39	19.4	17.27	43.39	19.5	30.21	32.23
20.3	44.85	6.33	20.3	37.16	59.66	20.3	53.24	43.50	20.4	17.24	43.70	20.5	30.28	32.54
21.3	44.61	6.49	21.3	36.31	59.89	21.3	52.98	43.59	21.4	17.21	44.01	21.5	30.35	32.85
22.3	44.34	6.65	22.3	35.42	60.10	22.3	52.73	43.66	22.4	17.16	44.33	22.5	30.41	33.17
23.3	44.07	6.81	23.3	34.47	60.31	23.3	52.48	43.72	23.4	17.11	44.65	23.5	30.46	33.50
24.3	43.79	6.96	24.3	33.45	60.51	24.3	52.23	43.78	24.4	17.05	45.00	24.5	30.50	33.85
25.3	43.49	7.10	25.3	32.40	60.69	25.3	51.99	43.85	25.4	16.96	45.33	25.5	30.52	34.20
26.3	43.19	7.21	26.3	31.33	60.87	26.3	51.76	43.93	26.4	16.86	45.66	26.5	30.53	34.55
27.3	42.89	7.31	27.3	30.24	61.01	27.3	51.52	44.01	27.4	16.75	45.95	27.5	30.52	34.90
28.3	42.60	7.40	28.3	29.18	61.15	28.3	51.26	44.09	28.4	16.62	46.24	28.5	30.48	35.23
29.3	42.31	7.46	29.3	28.16	61.28	29.3	51.00	44.17	29.4	16.50	46.51	29.5	30.47	35.52
30.3	42.04	7.51	30.3	27.20	61.38	30.3	50.72	44.25	30.4	16.39	46.76	30.5	30.45	35.81
31.3	41.79	7.56	31.3	26.29	61.49	31.3	50.43	44.31	31.4	16.29	47.01	31.5	30.43	36.10
	13.77	+13.73		51.30	+51.29		11.90	−11.86		12.32	+12.28		11.85	+11.81
$0^h\ 57^m\ 24^s.633$			$1^h\ 31^m\ 11^s.709$			$1^h\ 41^m\ 54^s.846$			$4^h\ 10^m\ 37^s.831$			$5^h\ 35^m\ 50^s.330$		
+85° 49′ 24″.14			+88° 52′ 20″.55			−85° 10′ 45″.22			+85° 20′ 28″.88			+85° 9′ 34″.51		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			**ζ Mensæ.** Mag. 5.6			**51 H. Cephei.** Mag. 5.3			**25 H. Camelop.** Mag. 5.1			**7 G. Octantis.** Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	5 45	−84 49	Dec.	6 46	−80 43	Dec.	7 3	+87 10	Dec.	7 14	+82 33	Dec.	7 15	−86 54
	s	″		s	″		s	″		s	″		s	″
0.5	51.75	42.35	0.6	50.43	45.38	0.6	56.51	20.10	0.6	30.15	52.13	0.6	37.46	19.84
1.5	51.82	42.67	1.6	50.49	45.69	1.6	56.83	20.34	1.6	30.28	52.34	1.6	37.71	20.12
2.5	51.87	43.03	2.6	50.56	46.02	2.6	57.15	20.54	2.6	30.41	52.54	2.6	37.97	20.43
3.5	51.92	43.42	3.6	50.63	46.38	3.6	57.47	20.75	3.6	30.54	52.72	3.6	38.22	20.75
4.5	51.96	43.81	4.6	50.69	46.76	4.6	57.81	20.95	4.6	30.68	52.87	4.6	38.43	21.10
5.5	51.97	44.19	5.6	50.74	47.14	5.6	58.18	21.13	5.6	30.82	53.04	5.6	38.61	21.46
6.5	51.97	44.57	6.6	50.80	47.51	6.6	58.56	21.32	6.6	30.99	53.21	6.6	38.77	21.82
7.5	51.96	44.92	7.6	50.84	47.87	7.6	58.97	21.55	7.6	31.16	53.39	7.6	38.91	22.16
8.5	51.94	45.26	8.6	50.87	48.23	8.6	59.36	21.78	8.6	31.33	53.61	8.6	39.03	22.49
9.5	51.93	45.58	9.6	50.90	48.55	9.6	59.75	22.05	9.6	31.49	53.84	9.6	39.15	22.79
10.5	51.92	45.89	10.6	50.94	48.86	10.6	60.09	22.34	10.6	31.64	54.11	10.6	39.28	23.08
11.5	51.92	46.20	11.6	50.98	49.17	11.6	60.42	22.63	11.6	31.77	54.39	11.6	39.41	23.37
12.5	51.92	46.51	12.6	51.02	49.50	12.6	60.69	22.92	12.6	31.89	54.65	12.6	39.56	23.66
13.5	51.93	46.85	13.6	51.06	49.82	13.6	60.94	23.20	13.6	31.99	54.90	13.6	39.73	23.97
14.5	51.93	47.21	14.6	51.10	50.18	14.6	61.18	23.48	14.6	32.09	55.14	14.6	39.90	24.30
15.5	51.93	47.57	15.5	51.14	50.55	15.6	61.41	23.72	15.6	32.18	55.38	15.6	40.05	24.65
16.5	51.92	47.96	16.5	51.18	50.93	16.6	61.63	23.97	16.6	32.28	55.61	16.6	40.19	25.01
17.5	51.89	48.34	17.5	51.21	51.32	17.6	61.87	24.21	17.6	32.38	55.84	17.6	40.33	25.37
18.5	51.85	48.72	18.5	51.24	51.71	18.6	62.11	24.45	18.6	32.48	56.07	18.6	40.43	25.74
19.5	51.81	49.10	19.5	51.25	52.10	19.5	62.36	24.70	19.6	32.59	56.28	19.6	40.53	26.12
20.5	51.76	49.47	20.5	51.26	52.48	20.5	62.63	24.97	20.6	32.71	56.52	20.6	40.59	26.50
21.5	51.69	49.81	21.5	51.28	52.85	21.5	62.89	25.25	21.6	32.82	56.78	21.6	40.65	26.87
22.5	51.62	50.16	22.5	51.28	53.22	22.5	63.15	25.54	22.5	32.94	57.04	22.6	40.70	27.20
23.5	51.55	50.48	23.5	51.29	53.57	23.5	63.40	25.85	23.5	33.05	57.32	23.5	40.73	27.53
24.5	51.48	50.79	24.5	51.29	53.91	24.5	63.64	26.17	24.5	33.15	57.63	24.5	40.76	27.86
25.5	51.41	51.11	25.5	51.29	54.24	25.5	63.84	26.49	25.5	33.25	57.94	25.5	40.79	28.19
26.5	51.35	51.43	26.5	51.29	54.58	26.5	64.03	26.82	26.5	33.34	58.24	26.5	40.82	28.52
27.5	51.29	51.74	27.5	51.29	54.92	27.5	64.17	27.15	27.5	33.40	58.56	27.5	40.86	28.85
28.5	51.23	52.07	28.5	51.30	55.27	28.5	64.31	27.47	28.5	33.46	58.84	28.5	40.91	29.19
29.5	51.15	52.43	29.5	51.30	55.63	29.5	64.42	27.77	29.5	33.51	59.12	29.5	40.96	29.55
30.5	51.07	52.79	30.5	51.30	56.00	30.5	64.53	28.06	30.5	33.57	59.39	30.5	41.00	29.92
31.5	50.98	53.15	31.5	51.29	56.41	31.5	64.66	28.33	31.5	33.63	59.64	31.5	41.02	30.33
	11.10	−11.05		6.21	−6.13		20.28	+20.25		7.73	+7.66		18.53	−18.51
	5^h 45^m $51^s.396$			6^h 46^m $48^s.653$			7^h 3^m $2^s.335$			7^h 14^m $7^s.912$			7^h 15^m $39^s.691$	
		−84° 49′ 44″.27			−80° 43′ 46″.14			+87° 10′ 43″.86			+82° 34′ 17″.32			−86° 54′ 19″.75

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**ζ Octantis.** Mag. 5.4			**1 H. Draconis.** Mag. 4.6			**ζ Chamæleontis.** Mag. 5.2			**30 H. Camelop.** Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	8 19	+88 52	Dec.	9 8	−85 20	Dec.	9 25	+81 40	Dec.	9 36	−80 34	Dec.	10 21	+82 57
	s	″		s	″		s	″		s	″		s	″
0.7	25.19	3.21	0.7	41.83	29.02	0.7	50.47	29.54	0.7	21.18	41.94	0.7	26.88	34.23
1.7	26.20	3.35	1.7	42.09	29.19	1.7	50.63	29.57	1.7	21.31	42.08	1.7	27.07	34.18
2.6	27.18	3.48	2.7	42.36	29.37	2.7	50.78	29.58	2.7	21.45	42.25	2.7	27.25	34.13
3.6	28.15	3.59	3.7	42.63	29.59	3.7	50.93	29.59	3.7	21.60	42.42	3.7	27.42	34.08
4.6	29.16	3.70	4.7	42.87	29.82	4.7	51.09	29.58	4.7	21.74	42.61	4.7	27.60	33.99
5.6	30.21	3.81	5.7	43.13	30.07	5.7	51.26	29.58	5.7	21.88	42.84	5.7	27.79	33.90
6.6	31.33	3.90	6.7	43.36	30.34	6.7	51.43	29.58	6.7	22.02	43.08	6.7	27.99	33.81
7.6	32.50	4.03	7.7	43.57	30.59	7.7	51.62	29.58	7.7	22.15	43.33	7.7	28.19	33.73
8.6	33.69	4.17	8.7	43.76	30.84	8.7	51.80	29.60	8.7	22.26	43.56	8.7	28.42	33.67
9.6	34.88	4.34	9.7	43.96	31.08	9.7	51.99	29.64	9.7	22.37	43.77	9.7	28.64	33.62
10.6	36.01	4.51	10.7	44.15	31.30	10.7	52.17	29.72	10.7	22.48	43.97	10.7	28.87	33.60
11.6	37.07	4.71	11.7	44.35	31.50	11.7	52.34	29.81	11.7	22.59	44.16	11.7	29.08	33.61
12.6	38.05	4.94	12.7	44.55	31.70	12.7	52.52	29.91	12.7	22.70	44.35	12.7	29.27	33.65
13.6	38.95	5.16	13.7	44.77	31.92	13.7	52.66	30.01	13.7	22.83	44.55	13.7	29.47	33.69
14.6	39.79	5.36	14.7	44.99	32.16	14.7	52.80	30.11	14.7	22.95	44.78	14.7	29.65	33.72
15.6	40.59	5.56	15.6	45.22	32.40	15.7	52.94	30.22	15.7	23.08	45.01	15.7	29.82	33.75
16.6	41.39	5.75	16.6	45.45	32.67	16.7	53.08	30.33	16.7	23.21	45.24	16.7	29.99	33.76
17.6	42.22	5.94	17.6	45.67	32.95	17.7	53.22	30.42	17.7	23.34	45.50	17.7	30.16	33.78
18.6	43.06	6.12	18.6	45.87	33.27	18.7	53.36	30.50	18.7	23.46	45.78	18.7	30.34	33.80
19.6	43.93	6.31	19.6	46.07	33.57	19.6	53.50	30.59	19.7	23.58	46.06	19.7	30.52	33.82
20.6	44.82	6.50	20.6	46.25	33.88	20.6	53.65	30.67	20.7	23.69	46.35	20.7	30.70	33.83
21.6	45.74	6.69	21.6	46.43	34.19	21.6	53.81	30.77	21.7	23.80	46.64	21.7	30.90	33.86
22.6	46.66	6.91	22.6	46.59	34.49	22.6	53.98	30.89	22.6	23.90	46.94	22.7	31.10	33.89
23.6	47.56	7.14	23.6	46.74	34.78	23.6	54.14	31.02	23.6	23.99	47.22	23.7	31.31	33.93
24.6	48.46	7.41	24.6	46.88	35.07	24.6	54.29	31.16	24.6	24.08	47.49	24.7	31.51	33.99
25.6	49.31	7.67	25.6	47.03	35.35	25.6	54.45	31.31	25.6	24.17	47.77	25.7	31.71	34.08
26.6	50.09	7.94	26.6	47.18	35.64	26.6	54.60	31.49	26.6	24.26	48.04	26.7	31.90	34.19
27.6	50.80	8.21	27.6	47.33	35.92	27.6	54.74	31.68	27.6	24.36	48.30	27.7	32.09	34.30
28.6	51.45	8.49	28.6	47.50	36.20	28.6	54.87	31.86	28.6	24.46	48.57	28.7	32.26	34.43
29.6	52.05	8.75	29.6	47.67	36.49	29.6	54.97	32.04	29.6	24.55	48.86	29.7	32.41	34.56
30.6	52.61	8.99	30.6	47.84	36.81	30.6	55.09	32.21	30.6	24.65	49.17	30.7	32.57	34.67
31.6	53.19	9.22	31.6	47.99	37.17	31.6	55.20	32.36	31.6	24.76	49.49	31.7	32.72	34.76
50.63		+50.62	12.31		−12.27	6.91		+6.83	6.11		−6.03	8.16		+8.10
$8^h\ 17^m\ 47^s.546$			$9^h\ 8^m\ 41^s.594$			$9^h\ 25^m\ 39^s.275$			$9^h\ 36^m\ 19^s.026$			$10^h\ 21^m\ 19^s.949$		
+88° 52′ 37″.80			−85° 20′ 26″.78			+81° 41′ 10″.13			−80° 34′ 39″.26			+82° 58′ 17″.67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	10 59	−84 9	Dec.	12 14	+88 8	Dec.	12 46	−84 41	Dec.	12 48	+83 50	Dec.	13 27	−85 22
	s	″		s	″		s	″		s	″		s	″
0.8	56.55	33.21	0.8	1.29	14.62	0.8	22.53	6.05	0.8	21.69	32.76	0.9	36.87	23.99
1.8	56.78	33.21	1.8	1.85	14.43	1.8	22.75	5.90	1.8	21.84	32.52	1.9	37.10	23.79
2.8	57.02	33.23	2.8	2.39	14.26	2.8	22.99	5.76	2.8	21.99	32.30	2.9	37.34	23.59
3.8	57.27	33.27	3.8	2.91	14.06	3.8	23.26	5.63	3.8	22.14	32.07	3.9	37.61	23.40
4.8	57.53	33.34	4.8	3.41	13.85	4.8	23.52	5.53	4.8	22.28	31.83	4.9	37.90	23.24
5.8	57.78	33.43	5.8	3.93	13.65	5.8	23.80	5.44	5.8	22.43	31.56	5.9	38.19	23.10
6.7	58.01	33.54	6.8	4.49	13.42	6.8	24.08	5.39	6.8	22.59	31.29	6.9	38.48	22.98
7.7	58.25	33.67	7.8	5.08	13.19	7.8	24.33	5.35	7.8	22.76	31.01	7.8	38.77	22.87
8.7	58.48	33.78	8.8	5.75	12.97	8.8	24.58	5.32	8.8	22.95	30.74	8.8	39.04	22.78
9.7	58.68	33.89	9.8	6.44	12.77	9.8	24.81	5.29	9.8	23.14	30.47	9.8	39.29	22.69
10.7	58.88	33.99	10.8	7.15	12.59	10.8	25.04	5.27	10.8	23.34	30.23	10.8	39.54	22.60
11.7	59.08	34.08	11.8	7.86	12.44	11.8	25.26	5.23	11.8	23.54	30.02	11.8	39.78	22.50
12.7	59.29	34.16	12.8	8.55	12.31	12.8	25.49	5.17	12.8	23.75	29.82	12.8	40.02	22.36
13.7	59.51	34.25	13.8	9.21	12.20	13.8	25.72	5.08	13.8	23.94	29.64	13.8	40.27	22.24
14.7	59.74	34.34	14.8	9.83	12.10	14.8	25.96	5.00	14.8	24.13	29.49	14.8	40.54	22.11
15.7	59.97	34.43	15.8	10.45	11.99	15.8	26.23	4.93	15.8	24.31	29.33	15.8	40.82	21.98
16.7	60.21	34.55	16.8	11.04	11.88	16.8	26.50	4.87	16.8	24.48	29.16	16.8	41.12	21.87
17.7	60.45	34.69	17.8	11.62	11.75	17.8	26.77	4.85	17.8	24.65	28.99	17.8	41.43	21.77
18.7	60.69	34.84	18.8	12.22	11.62	18.8	27.06	4.84	18.8	24.82	28.82	18.8	41.74	21.69
19.7	60.92	35.01	19.8	12.83	11.49	19.8	27.34	4.84	19.8	25.01	28.64	19.8	42.05	21.63
20.7	61.15	35.20	20.8	13.47	11.36	20.8	27.61	4.86	20.8	25.19	28.47	20.8	42.36	21.58
21.7	61.38	35.38	21.8	14.13	11.25	21.8	27.88	4.89	21.8	25.39	28.30	21.8	42.65	21.54
22.7	61.57	35.56	22.8	14.83	11.14	22.8	28.13	4.92	22.8	25.59	28.12	22.8	42.95	21.53
23.7	61.77	35.75	23.8	15.54	11.04	23.8	28.38	4.96	23.8	25.81	27.96	23.8	43.24	21.50
24.7	61.96	35.94	24.8	16.28	10.95	24.8	28.63	5.00	24.8	26.04	27.81	24.8	43.51	21.47
25.7	62.15	36.12	25.7	17.02	10.88	25.8	28.86	5.03	25.8	26.26	27.67	25.8	43.79	21.44
26.7	62.34	36.29	26.7	17.76	10.82	26.8	29.10	5.06	26.8	26.48	27.55	26.8	44.05	21.41
27.7	62.54	36.47	27.7	18.48	10.79	27.8	29.34	5.07	27.8	26.70	27.45	27.8	44.32	21.38
28.7	62.73	36.63	28.7	19.18	10.76	28.8	29.59	5.10	28.8	26.90	27.36	28.8	44.60	21.35
29.7	62.95	36.81	29.7	19.83	10.73	29.8	29.85	5.13	29.8	27.10	27.28	29.8	44.90	21.31
30.7	63.17	37.01	30.7	20.44	10.70	30.8	30.12	5.16	30.8	27.29	27.22	30.8	45.22	21.28
31.7	63.39	37.24	31.7	21.04	10.67	31.8	30.42	5.21	31.8	27.48	27.14	31.8	45.54	21.27
	9.83	−9.78		30.75	+30.74		10.79	−10.75		9.32	+9.27		12.40	−12.35
$10^{h}\ 59^{m}\ 54^{s}.546$			$12^{h}\ 14^{m}\ 29^{s}.190$			$12^{h}\ 46^{m}\ 19^{s}.119$			$12^{h}\ 48^{m}\ 31^{s}.308$			$13^{h}\ 27^{m}\ 32^{s}.891$		
−84° 9′ 29″.33			+88° 8′ 56″.19			−84° 41′ 1″.57			+83° 51′ 11″.30			−85° 22′ 19″.48		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			**Groombridge 2283.** Mag. 7.2			**ρ Octantis.** Mag. 5.7			**ε Ursæ Minoris.** Mag. 4.4			**59 G. Apodis.** Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	14 13	−83 17	Dec.	15 2	+87 32	Dec.	15 24	−84 11	Dec.	16 53	+82 10	Dec.	17 16	−80 47
	s	″		s	″		s	″		s	″		s	″
0.9	50.71	58.73	0.9	5.07	22.06	0.9	28.81	58.87	1.0	54.97	21.82	1.0	22.48	15.79
1.9	50.83	58.48	1.9	5.20	21.73	1.9	28.90	58.56	2.0	54.94	21.48	2.0	22.47	15.46
2.9	50.97	58.23	2.9	5.31	21.42	2.9	29.00	58.24	3.0	54.91	21.17	3.0	22.47	15.13
3.9	51.14	57.99	3.9	5.41	21.11	3.9	29.14	57.92	4.0	54.87	20.86	4.0	22.47	14.76
4.9	51.32	57.77	4.9	5.49	20.80	4.9	29.28	57.64	5.0	54.83	20.55	5.0	22.51	14.41
5.9	51.51	57.57	5.9	5.58	20.47	5.9	29.44	57.35	5.9	54.79	20.22	6.0	22.55	14.08
6.9	51.70	57.39	6.9	5.66	20.10	6.9	29.61	57.10	6.9	54.75	19.89	7.0	22.59	13.76
7.9	51.89	57.25	7.9	5.78	19.74	7.9	29.78	56.85	7.9	54.71	19.52	8.0	22.65	13.47
8.9	52.06	57.11	8.9	5.92	19.37	8.9	29.94	56.64	8.9	54.68	19.15	9.0	22.70	13.18
9.9	52.23	56.97	9.9	6.11	18.99	9.9	30.09	56.42	9.9	54.65	18.76	10.0	22.75	12.91
10.9	52.38	56.82	10.9	6.34	18.62	10.9	30.23	56.20	10.9	54.64	18.35	10.9	22.78	12.65
11.9	52.53	56.65	11.9	6.58	18.29	11.9	30.36	55.98	11.9	54.64	17.95	11.9	22.81	12.38
12.9	52.68	56.48	12.9	6.85	17.97	12.9	30.48	55.74	12.9	54.64	17.57	12.9	22.84	12.09
13.9	52.84	56.30	13.9	7.10	17.67	13.9	30.61	55.46	13.9	54.66	17.23	13.9	22.86	11.78
14.9	53.01	56.11	14.9	7.35	17.38	14.9	30.75	55.19	14.9	54.67	16.89	14.9	22.89	11.46
15.9	53.18	55.93	15.9	7.58	17.11	15.9	30.92	54.92	15.9	54.68	16.55	15.9	22.92	11.14
16.9	53.36	55.75	16.9	7.82	16.83	16.9	31.09	54.66	16.9	54.68	16.25	16.9	22.96	10.80
17.9	53.56	55.59	17.9	8.04	16.56	17.9	31.27	54.41	17.9	54.69	15.94	17.9	23.01	10.47
18.9	53.77	55.45	18.9	8.27	16.29	18.9	31.45	54.16	18.9	54.69	15.62	18.9	23.06	10.14
19.8	53.98	55.31	19.9	8.49	15.97	19.9	31.64	53.93	19.9	54.71	15.28	19.9	23.13	9.81
20.8	54.18	55.19	20.9	8.73	15.67	20.9	31.84	53.73	20.9	54.72	14.93	20.9	23.21	9.51
21.8	54.38	55.09	21.9	8.99	15.36	21.9	32.05	53.53	21.9	54.73	14.57	21.9	23.30	9.23
22.8	54.58	55.01	22.9	9.27	15.05	22.9	32.25	53.36	22.9	54.74	14.21	22.9	23.38	8.94
23.8	54.78	54.94	23.9	9.58	14.76	23.9	32.44	53.18	23.9	54.78	13.83	23.9	23.44	8.68
24.8	54.97	54.86	24.9	9.90	14.46	24.9	32.63	53.02	24.9	54.81	13.46	24.9	23.51	8.43
25.8	55.15	54.77	25.9	10.26	14.16	25.9	32.81	52.85	25.9	54.85	13.08	25.9	23.57	8.18
26.8	55.33	54.69	26.9	10.63	13.88	26.9	32.99	52.67	26.9	54.90	12.71	26.9	23.64	7.93
27.8	55.51	54.60	27.9	11.01	13.60	27.9	33.16	52.49	27.9	54.95	12.37	27.9	23.70	7.66
28.8	55.69	54.49	28.9	11.38	13.37	28.9	33.33	52.29	28.9	55.00	12.04	28.9	23.76	7.38
29.8	55.89	54.39	29.9	11.73	13.15	29.9	33.53	52.10	29.9	55.05	11.72	29.9	23.85	7.07
30.8	56.11	54.30	30.9	12.07	12.92	30.9	33.73	51.90	30.9	55.10	11.43	30.9	23.92	6.75
31.8	56.33	54.21	31.8	12.39	12.71	31.9	33.96	51.70	31.9	55.15	11.14	31.9	24.01	6.44
	8.57	−8.51		23.28	+23.26		9.89	−9.84		7.34	+7.27		6.25	−6.17
14^h	13^m	$46^s.350$	15^h	3^m	$2^s.510$	15^h	24^m	$23^s.351$	16^h	54^m	$12^s.991$	17^h	16^m	$17^s.234$
−83°	17′	54″.52	+87°	32′	42″.66	−84°	11′	55″.43	+82°	10′	21″.42	−80°	47′	14″.27

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			**χ Octantis.** Mag. 5.2			**λ Ursæ Minoris.** Mag. 6.6			**σ Octantis.** Mag. 5.5			**76 Draconis.** Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	17 57	+86 36	Dec.	18 7	−87 39	Dec.	18 57	+89 1	Dec.	19 31	−89 13	Dec.	20 48	+82 14
	s	″		s	″		s	″		s	″		s	″
1.1	37.73	63.48	1.1	34.29	51.89	1.1	49.90	35.90	1.1	17.00	12.61	1.2	24.39	34.99
2.1	37.55	63.19	2.1	34.11	51.57	2.1	49.02	35.66	2.1	15.92	12.33	2.2	24.24	34.88
3.1	37.38	62.91	3.1	33.97	51.22	3.1	48.14	35.45	3.1	14.88	12.02	3.2	24.10	34.79
4.0	37.20	62.65	4.1	33.86	50.85	4.1	47.26	35.25	4.1	13.92	11.70	4.2	23.96	34.71
5.0	37.00	62.38	5.1	33.78	50.47	5.1	46.30	35.05	5.1	13.07	11.37	5.2	23.82	34.62
6.0	36.80	62.11	6.0	33.77	50.10	6.1	45.29	34.83	6.1	12.34	11.05	6.2	23.67	34.53
7.0	36.57	61.83	7.0	33.80	49.77	7.1	44.23	34.61	7.1	11.75	10.73	7.2	23.52	34.44
8.0	36.36	61.50	8.0	33.83	49.44	8.1	43.16	34.37	8.1	11.23	10.41	8.2	23.36	34.34
9.0	36.16	61.16	9.0	33.86	49.12	9.1	42.11	34.08	9.1	10.76	10.11	9.2	23.20	34.21
10.0	35.98	60.79	10.0	33.88	48.84	10.1	41.12	33.80	10.1	10.26	9.82	10.1	23.03	34.04
11.0	35.83	60.43	11.0	33.88	48.56	11.1	40.22	33.50	11.1	9.72	9.55	11.1	22.86	33.86
12.0	35.70	60.08	12.0	33.84	48.25	12.1	39.42	33.18	12.1	9.08	9.28	12.1	22.71	33.67
13.0	35.60	59.74	13.0	33.81	47.93	13.1	38.71	32.87	13.1	8.38	9.01	13.1	22.57	33.47
14.0	35.50	59.42	14.0	33.76	47.60	14.1	38.06	32.58	14.1	7.64	8.70	14.1	22.44	33.27
15.0	35.42	59.10	15.0	33.71	47.24	15.1	37.46	32.30	15.1	6.92	8.38	15.1	22.32	33.07
16.0	35.34	58.81	16.0	33.69	46.88	16.1	36.87	32.02	16.1	6.23	8.05	16.1	22.19	32.91
17.0	35.25	58.51	17.0	33.71	46.51	17.1	36.26	31.78	17.1	5.60	7.69	17.1	22.07	32.74
18.0	35.15	58.21	18.0	33.76	46.14	18.1	35.62	31.53	18.1	5.06	7.32	18.1	21.94	32.57
19.0	35.06	57.91	19.0	33.84	45.77	19.0	34.97	31.26	19.1	4.61	6.95	19.1	21.83	32.39
20.0	34.97	57.60	20.0	33.93	45.41	20.0	34.30	31.00	20.1	4.25	6.59	20.1	21.71	32.22
21.0	34.87	57.27	21.0	34.06	45.07	21.0	33.63	30.71	21.1	3.96	6.24	21.1	21.58	32.04
21.9	34.78	56.94	22.0	34.20	44.72	22.0	32.96	30.40	22.1	3.75	5.90	22.1	21.45	31.84
22.9	34.70	56.60	23.0	34.35	44.39	23.0	32.31	30.09	23.1	3.56	5.56	23.1	21.31	31.61
23.9	34.63	56.24	23.9	34.49	44.10	24.0	31.69	29.76	24.1	3.40	5.24	24.1	21.18	31.38
24.9	34.57	55.87	24.9	34.64	43.80	25.0	31.11	29.42	25.1	3.23	4.93	25.1	21.05	31.14
25.9	34.54	55.50	25.9	34.77	43.51	26.0	30.61	29.08	26.1	3.07	4.62	26.1	20.94	30.87
26.9	34.52	55.13	26.9	34.88	43.20	27.0	30.20	28.75	27.0	2.84	4.30	27.1	20.83	30.61
27.9	34.52	54.78	27.9	34.99	42.89	28.0	29.85	28.43	28.0	2.56	3.99	28.1	20.72	30.35
28.9	34.54	54.44	28.9	35.10	42.55	29.0	29.56	28.11	29.0	2.27	3.65	29.1	20.61	30.10
29.9	34.56	54.11	29.9	35.23	42.21	30.0	29.28	27.79	30.0	2.00	3.28	30.1	20.52	29.85
30.9	34.57	53.80	30.9	35.39	41.85	31.0	29.04	27.51	31.0	1.79	2.91	31.1	20.43	29.61
31.9	34.58	53.51	31.9	35.57	41.48	32.0	28.75	27.25	32.0	1.66	2.53	32.1	20.34	29.38
16.94 +16.91			24.52 −24.50			58.81 +58.80			73.36 −73.36			7.41 +7.34		
17ʰ 58ᵐ 22ˢ.311			18ʰ 7ᵐ 23ˢ.343			19ʰ 0ᵐ 15ˢ.079			19ʰ 30ᵐ 50ˢ.769			20ʰ 48ᵐ 32ˢ.146		
+86° 36′ 51″.04			−87° 39′ 50″.89			+89° 1′ 12″.80			−89° 13′ 13″.35			+82° 13′ 56″.82		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			**β Octantis.** Mag. 4.3			**39 H. Cephei.** Mag. 5.6			**γ¹ Octantis.** Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	21 38	−83 5	Dec.	22 16	−86 22	Dec.	22 37	−81 48	Dec.	23 27	+86 52	Dec.	23 47	−82 28
	s	″		s	″		s	″		s	″		s	″
1.2	44.11	30.81	1.2	39.89	47.09	1.2	56.41	20.33	1.3	55.10	22.79	1.3	27.92	3.44
2.2	43.93	30.71	2.2	39.53	47.04	2.2	56.26	20.32	2.3	54.74	22.90	2.3	27.75	3.54
3.2	43.74	30.57	3.2	39.16	46.96	3.2	56.09	20.28	3.3	54.40	23.02	3.3	27.57	3.60
4.2	43.56	30.43	4.2	38.78	46.86	4.2	55.94	20.21	4.3	54.07	23.15	4.3	27.39	3.66
5.2	43.39	30.26	5.2	38.41	46.72	5.2	55.77	20.13	5.3	53.74	23.29	5.3	27.21	3.69
6.2	43.24	30.06	6.2	38.08	46.57	6.2	55.62	20.04	6.3	53.40	23.45	6.3	27.04	3.70
7.2	43.10	29.86	7.2	37.78	46.42	7.2	55.49	19.91	7.3	53.03	23.62	7.3	26.87	3.68
8.2	42.98	29.66	8.2	37.49	46.26	8.2	55.37	19.79	8.3	52.62	23.77	8.3	26.72	3.67
9.2	42.86	29.48	9.2	37.22	46.10	9.2	55.25	19.69	9.3	52.22	23.91	9.3	26.58	3.65
10.2	42.74	29.31	10.2	36.97	45.96	10.2	55.13	19.58	10.3	51.79	24.02	10.3	26.45	3.63
11.2	42.62	29.15	11.2	36.67	45.84	11.2	55.01	19.50	11.3	51.35	24.12	11.3	26.31	3.62
12.2	42.48	29.01	12.2	36.38	45.74	12.2	54.88	19.43	12.3	50.91	24.18	12.3	26.16	3.63
13.2	42.34	28.86	13.2	36.07	45.62	13.2	54.74	19.35	13.3	50.50	24.21	13.3	26.00	3.65
14.2	42.18	28.69	14.2	35.75	45.50	14.2	54.59	19.28	14.2	50.11	24.24	14.3	25.83	3.67
15.2	42.02	28.52	15.2	35.42	45.37	15.2	54.45	19.19	15.2	49.73	24.27	15.3	25.66	3.68
16.2	41.87	28.33	16.2	35.08	45.20	16.2	54.29	19.07	16.2	49.36	24.31	16.3	25.48	3.69
17.2	41.72	28.11	17.2	34.74	45.02	17.2	54.14	18.95	17.2	49.01	24.35	17.3	25.29	3.66
18.2	41.56	27.89	18.2	34.40	44.84	18.2	53.99	18.80	18.2	48.65	24.39	18.3	25.11	3.62
19.2	41.42	27.65	19.2	34.09	44.65	19.2	53.85	18.65	19.2	48.29	24.43	19.2	24.94	3.58
20.2	41.29	27.41	20.2	33.80	44.45	20.2	53.71	18.48	20.2	47.92	24.47	20.2	24.77	3.51
21.2	41.18	27.16	21.2	33.51	44.23	21.2	53.58	18.31	21.2	47.54	24.52	21.2	24.62	3.42
22.2	41.07	26.91	22.2	33.24	44.00	22.2	53.46	18.13	22.2	47.13	24.56	22.2	24.47	3.34
23.1	40.96	26.67	23.2	33.00	43.78	23.2	53.35	17.95	23.2	46.71	24.59	23.2	24.32	3.25
24.1	40.86	26.43	24.2	32.75	43.58	24.2	53.25	17.77	24.2	46.29	24.60	24.2	24.17	3.15
25.1	40.77	26.19	25.2	32.52	43.37	25.2	53.15	17.60	25.2	45.86	24.60	25.2	24.03	3.05
26.1	40.67	25.96	26.2	32.28	43.17	26.2	53.03	17.43	26.2	45.42	24.59	26.2	23.89	2.97
27.1	40.57	25.74	27.2	32.02	42.98	27.2	52.91	17.29	27.2	45.00	24.55	27.2	23.74	2.90
28.1	40.44	25.53	28.2	31.76	42.79	28.2	52.79	17.13	28.2	44.59	24.50	28.2	23.57	2.83
29.1	40.31	25.29	29.2	31.49	42.57	29.2	52.66	16.96	29.2	44.21	24.44	29.2	23.41	2.76
30.1	40.19	25.02	30.2	31.20	42.34	30.2	52.52	16.78	30.2	43.84	24.38	30.2	23.24	2.68
31.1	40.07	24.75	31.2	30.91	42.10	31.2	52.39	16.58	31.2	43.50	24.33	31.2	23.07	2.58
32.1	39.95	24.46	32.2	30.63	41.83	32.2	52.26	16.35	32.2	43.16	24.29	32.2	22.90	2.44
8.31		−8.25	15.83		−15.80	7.02		−6.94	18.33		+18.31	7.63		−7.56
$21^h\ 38^m\ 38^s.548$			$22^h\ 16^m\ 33^s.212$			$22^h\ 37^m\ 51^s.624$			$23^h\ 27^m\ 43^s.571$			$23^h\ 47^m\ 23^s.637$		
−83° 5′ 34″.33			−86° 22′ 50″.92			−81° 48′ 24″.80			+86° 51′ 38″.62			−82° 28′ 8″.42		

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**33 Piscium.** Mag. 4.7				***α* Andromedæ.** (*Alpheratz.*) Mag. 2.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′	
	0 1		− 6 9		0 4		+28 38	
	s		″		s		″	
Jan. 0.2	12.204		35.30		12.785		50.91	
10.2	12.094	110	35.90	60	12.646	139	49.98	93
20.2	11.991	103	36.39	49	12.513	133	48.77	121
30.1	11.900	91	36.74	35	12.393	120	47.37	140
Feb. 9.1	11.827	73	36.93	19	12.289	104	45.81	156
19.1	11.772	55	36.96	3 —	12.211	78	44.16	165
Mar. 1.1	11.743	29	36.78	18	12.163	48	42.51	165
11.0	11.743	0	36.40	38	12.152	11 —	40.92	159
21.0	11.777	34	35.78	62	12.182	30	39.47	145
31.0	11.848	71	34.93	85	12.258	76	38.24	123
Apr. 10.0	11.958	110	33.84	109	12.379	121	37.28	96
19.9	12.107	149	32.52	132	12.547	168	36.66	62
29.9	12.293	186	30.98	154	12.759	212	36.41	25 —
May 9.9	12.516	223	29.25	173	13.010	251	36.54	13
19.8	12.770	254	27.38	187	13.298	288	37.07	53
29.8	13.049	279	25.39	199	13.612	314	37.97	90
June 8.8	13.347	298	23.35	204	13.943	331	39.24	127
18.8	13.656	309	21.29	206	14.285	342	40.84	160
28.7	13.968	312	19.28	201	14.628	343	42.72	188
July 8.7	14.273	305	17.37	191	14.964	336	44.83	211
18.7	14.566	293	15.60	177	15.283	319	47.12	229
28.7	14.839	273	14.04	156	15.577	294	49.53	241
Aug. 7.6	15.083	244	12.69	135	15.841	264	52.00	247
17.6	15.295	212	11.61	108	16.071	230	54.49	249
27.6	15.471	176	10.80	81	16.261	190	56.93	244
Sept. 6.5	15.609	138	10.25	55	16.411	150	59.28	235
16.5	15.707	98	9.99	26	16.519	108	61.50	222
26.5	15.768	61	9.97	2 —	16.586	67	63.54	204
Oct. 6.5	15.791	23 —	10.19	22	16.615	29 —	65.38	184
16.4	15.781	10	10.60	41	16.610	5	66.98	160
26.4	15.743	38	11.17	57	16.572	38	68.33	135
Nov. 5.4	15.680	63	11.87	70	16.506	66	69.40	107
15.4	15.599	81	12.64	77	16.418	88	70.18	78
25.3	15.502	97	13.45	81	16.311	107	70.65	47
Dec. 5.3	15.395	107	14.27	82	16.187	124	70.80	15 —
15.3	15.281	114	15.07	80	16.052	135	70.63	17
25.2	15.165	116	15.82	75	15.911	141	70.16	47
35.2	15.050	115	16.48	66	15.767	144	69.36	80
Mean Place	11.398		38.49		11.835		35.75	
Sec δ, Tan δ	1.006		−0.108		1.140		+0.546	
Dψα, Dωα	+0.06		+0.01		+0.06		−0.04	
Dψδ, Dωδ	+0.4		0.0		+0.4		0.0	

Washington Mean Time.	***β* Cassiopeiæ.** Mag. 2.4				***ε* Phœnicis.** Mag. 3.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′	
	0 4		+58 42		0 5		−46 11	
	s		″		s		″	
Jan. 0.2	51.872		34.24		18.724		48.95	
10.2	51.566	306	33.49	75	18.518	206	48.62	33
20.2	51.270	296	32.22	127	18.328	190	47.84	78
30.1	50.999	271	30.49	173	18.160	168	46.61	123
Feb. 9.1	50.763	236	28.35	214	18.017	143	44.98	163
19.1	50.577	186	25.92	243	17.908	109	42.98	200
Mar. 1.1	50.450	127	23.26	266	17.836	72	40.67	231
11.0	50.392	58 —	20.52	274	17.806	30 —	38.08	259
21.0	50.408	16	17.79	273	17.822	16	35.27	281
31.0	50.504	96	15.21	258	17.887	65	32.31	296
Apr. 10.0	50.679	175	12.84	237	18.004	117	29.24	307
19.9	50.931	252	10.81	203	18.172	168	26.13	311
29.9	51.254	323	9.19	162	18.390	218	23.05	308
May 9.9	51.640	386	8.03	116	18.656	266	20.07	298
19.8	52.077	437	7.37	66	18.964	308	17.24	283
29.8	52.553	476	7.24	13 —	19.309	345	14.65	259
June 8.8	53.056	503	7.64	40	19.680	371	12.33	232
18.8	53.571	515	8.56	92	20.069	389	10.37	196
28.7	54.085	514	9.96	140	20.468	399	8.79	158
July 8.7	54.584	499	11.83	187	20.863	395	7.66	113
18.7	55.056	472	14.10	227	21.245	382	6.98	68
28.7	55.490	434	16.71	261	21.603	358	6.79	19 —
Aug. 7.6	55.878	388	19.61	290	21.928	325	7.07	28
17.6	56.212	334	22.73	312	22.211	283	7.81	74
27.6	56.487	275	26.01	328	22.444	233	9.00	119
Sept. 6.5	56.699	212	29.37	336	22.624	180	10.58	158
16.5	56.848	149	32.75	338	22.747	123	12.46	188
26.5	56.931	83	36.09	334	22.813	66	14.61	215
Oct. 6.5	56.953	22 —	39.30	321	22.822	9 —	16.91	230
16.4	56.916	37	42.32	302	22.779	43	19.28	237
26.4	56.822	94	45.10	278	22.688	91	21.62	234
Nov. 5.4	56.677	145	47.55	245	22.556	132	23.82	220
15.4	56.487	190	49.63	208	22.390	166	25.81	199
25.3	56.256	231	51.28	165	22.200	190	27.50	169
Dec. 5.3	55.992	264	52.44	116	21.991	209	28.81	131
15.3	55.702	290	53.09	65	21.774	217	29.71	90
25.2	55.395	307	53.21	12 —	21.555	219	30.17	46 —
35.2	55.083	312	52.77	44	21.341	214	30.15	2
Mean Place	50.801		11.00		18.189		40.02	
Sec δ, Tan δ	1.925		+1.645		1.445		−1.042	
Dψα, Dωα	+0.06		−0.11		+0.06		+0.07	
Dψδ, Dωδ	+0.4		0.0		+0.4		0.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	22 Andromedæ.				γ Pegasi.				σ Andromedæ.				ι Ceti.			
	Mag. 5.1				Mag. 2.9				Mag. 4.5				Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	0 6		+45 37		0 9		+14 43		0 14		+36 20		0 15		− 9 15	
	s		″		s		″		s		″		s		″	
Jan. 0.2	7.368	202	37.67	87	4.702	116	70.32	85	6.570	163	27.71	85	18.944	114	80.36	58
10.2	7.166	194	36.80	129	4.586	113	69.47	97	6.407	159	26.86	119	18.830	110	80.94	43
20.2	6.972	180	35.51	165	4.473	103	68.50	104	6.248	147	25.67	147	18.720	101	81.37	25
30.2	6.792	154	33.86	194	4.370	89	67.46	107	6.101	127	24.20	170	18.619	87	81.62	8
Feb. 9.1	6.638	121	31.92	217	4.281	67	66.39	105	5.974	103	22.50	185	18.532	67	81.70 —	11
19.1	6.517	80	29.75	229	4.214	41	65.34	97	5.871	68	20.65	193	18.465	44	81.59	34
Mar. 1.1	6.437	32	27.46	233	4.173	10	64.37	84	5.803	29	18.72	192	18.421	15	81.25	56
11.0	6.405 —	23	25.13	225	4.163 —	27	63.53	66	5.774 —	16	16.80	183	18.406 —	19	80.69	80
21.0	6.428	79	22.88	207	4.190	66	62.87	43	5.790	66	14.97	164	18.425	56	79.89	102
31.0	6.507	140	20.81	182	4.256	108	62.44	16	5.856	117	13.33	139	18.481	95	78.87	127
Apr. 10.0	6.647	197	18.99	148	4.364	150	62.28 —	15	5.973	168	11.94	106	18.576	135	77.60	149
19.9	6.844	251	17.51	108	4.514	190	62.43	45	6.141	217	10.88	69	18.711	176	76.11	169
29.9	7.095	300	16.43	65	4.704	228	62.88	77	6.358	261	10.19	28	18.887	212	74.42	185
May 9.9	7.395	342	15.78	17	4.932	261	63.65	108	6.619	300	9.91 —	14	19.099	246	72.57	198
19.8	7.737	373	15.61 —	30	5.193	287	64.73	135	6.919	329	10.05	57	19.345	272	70.59	207
29.8	8.110	395	15.91	78	5.480	306	66.08	161	7.248	353	10.62	96	19.617	294	68.52	211
June 8.8	8.505	406	16.69	122	5.786	318	67.69	182	7.601	364	11.58	136	19.911	308	66.41	209
18.8	8.911	407	17.91	164	6.104	320	69.51	197	7.965	366	12.94	172	20.219	312	64.32	202
28.7	9.318	396	19.55	202	6.424	314	71.48	207	8.331	359	14.66	201	20.531	309	62.30	189
July 8.7	9.714	376	21.57	232	6.738	299	73.55	214	8.690	343	16.67	225	20.840	298	60.41	171
18.7	10.090	347	23.89	259	7.037	280	75.69	213	9.033	319	18.92	245	21.138	281	58.70	150
28.7	10.437	310	26.48	278	7.317	251	77.82	208	9.352	288	21.37	260	21.419	254	57.20	124
Aug. 7.6	10.747	268	29.26	292	7.568	220	79.90	198	9.640	252	23.97	266	21.673	223	55.96	97
17.6	11.015	222	32.18	300	7.788	185	81.88	185	9.892	211	26.63	268	21.896	190	54.99	67
27.6	11.237	174	35.18	300	7.973	146	83.73	167	10.103	169	29.31	264	22.086	151	54.32	38
Sept. 6.5	11.411	125	38.18	296	8.119	108	85.40	148	10.272	125	31.95	255	22.237	112	53.94	8
16.5	11.536	75	41.14	285	8.227	70	86.88	126	10.397	82	34.50	243	22.349	74	53.86 —	18
26.5	11.611	28	43.99	270	8.297	34	88.14	104	10.479	40	36.93	225	22.423	37	54.04	41
Oct. 6.5	11.639 —	15	46.69	248	8.331	3	89.18	82	10.519	3	39.18	203	22.460	4	54.45	61
16.4	11.624	57	49.17	221	8.334 —	28	90.00	58	10.522 —	33	41.21	179	22.464 —	28	55.06	77
26.4	11.567	91	51.38	191	8.306	52	90.58	36	10.489	65	43.00	149	22.436	52	55.83	88
Nov. 5.4	11.476	125	53.29	156	8.254	75	90.94	14	10.424	91	44.49	117	22.384	74	56.71	94
15.4	11.351	151	54.85	116	8.179	90	91.08 —	6	10.333	116	45.66	84	22.310	91	57.65	96
25.3	11.200	174	56.01	74	8.089	103	91.02	28	10.217	134	46.50	49	22.219	104	58.61	93
Dec. 5.3	11.026	190	56.75	30	7.986	113	90.74	45	10.083	150	46.99	10	22.115	112	59.54	87
15.3	10.836	201	57.05 —	16	7.873	121	90.29	65	9.933	161	47.09 —	28	22.003	119	60.41	79
25.2	10.635	207	56.89	60	7.752	122	89.64	78	9.772	167	46.81	65	21.884	119	61.20	67
35.2	10.428		56.29		7.630		88.86		9.605		46.16		21.765		61.87	
Mean Place	6.340		17.51		3.767		59.89		5.508		10.26		18.072		82.23	
Sec δ, Tan δ	1.430		+1.022		1.034		+0.263		1.241		+0.736		1.013		−0.163	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		−0.07		+0.06		−0.02		+0.06		−0.05		+0.06		+0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.4		0.0		+0.4		0.0		+0.4		+0.1		+0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Tucanæ. Mag. 4.3				44 Piscium. Mag. 6.0				β Hydri. Mag. 2.9				α Phœnicis. Mag. 2.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	0 15		−65 20		0 21		+ 1 29		0 21		−77 42		0 22		−42 44	
	s		″		s		″		s		″		s		″	
Jan. 0.2	51.98	41	74.22	77	15.941	112	33.61	72	30.46	92	51.40	100	17.744	196	53.58	6
10.2	51.57	38	73.45	133	15.829	110	32.89	68	29.54	87	50.40	159	17.548	185	53.52	51
20.2	51.19	36	72.12	184	15.719	102	32.21	62	28.67	79	48.81	212	17.363	169	53.01	93
30.2	50.83	30	70.28	232	15.617	89	31.59	53	27.88	67	46.69	261	17.194	148	52.08	136
Feb. 9.1	50.53	24	67.96	272	15.528	71	31.06	41	27.21	57	44.08	300	17.046	120	50.72	174
19.1	50.29	18	65.24	306	15.457	48	30.65	25	26.64	44	41.08	333	16.926	87	48.98	207
Mar. 1.1	50.11	11	62.18	332	15.409	19	30.40	8	26.20	29	37.75	359	16.839	50	46.91	236
11.0	50.00	3	58.86	352	15.390	— 14	30.32	— 14	25.91	14	34.16	373	16.789	7	44.55	262
21.0	49.97	— 5	55.34	363	15.404	52	30.46	37	25.77	— 1	30.43	382	16.782	— 41	41.93	281
31.0	50.02	13	51.71	367	15.456	90	30.83	62	25.78	17	26.61	381	16.823	89	39.12	294
Apr. 10.0	50.15	20	48.04	362	15.546	132	31.45	87	25.95	33	22.80	372	16.912	141	36.18	302
19.9	50.35	29	44.42	349	15.678	172	32.32	114	26.28	47	19.08	355	17.053	189	33.16	305
29.9	50.64	37	40.93	331	15.850	209	33.46	136	26.75	62	15.53	331	17.242	237	30.11	299
May 9.9	51.01	44	37.62	304	16.059	242	34.82	158	27.37	75	12.22	299	17.479	279	27.12	288
19.9	51.45	49	34.58	270	16.301	271	36.40	176	28.12	85	9.23	260	17.758	317	24.24	270
29.8	51.94	54	31.88	231	16.572	292	38.16	189	28.97	95	6.63	217	18.075	346	21.54	244
June 8.8	52.48	57	29.57	185	16.864	306	40.05	197	29.92	101	4.46	167	18.421	367	19.10	213
18.8	53.05	59	27.72	136	17.170	311	42.02	201	30.93	106	2.79	114	18.788	378	16.97	178
28.7	53.64	60	26.36	83	17.481	307	44.03	199	31.99	107	1.65	58	19.166	379	15.19	136
July 8.7	54.24	58	25.53	28 —	17.788	298	46.02	192	33.06	105	1.07	— 1	19.545	371	13.83	92
18.7	54.82	56	25.25	28	18.086	280	47.94	180	34.11	101	1.08	57	19.916	349	12.91	45
28.7	55.38	50	25.53	83	18.366	255	49.74	163	35.12	93	1.65	114	20.265	322	12.46	— 2
Aug. 7.6	55.88	45	26.36	133	18.621	225	51.37	144	36.05	81	2.79	165	20.587	285	12.48	49
17.6	56.33	36	27.69	181	18.846	192	52.81	121	36.86	70	4.44	212	20.872	241	12.97	93
27.6	56.69	29	29.50	222	19.038	155	54.02	97	37.56	53	6.56	252	21.113	192	13.90	136
Sept. 6.6	56.98	20	31.72	254	19.193	117	54.99	71	38.09	36	9.08	281	21.305	140	15.26	171
16.5	57.18	11	34.26	276	19.310	80	55.70	46	38.45	18	11.89	303	21.445	87	16.97	198
26.5	57.29	0	37.02	288	19.390	46	56.16	23	38.63	— 1	14.92	311	21.532	35	18.95	220
Oct. 6.5	57.29	8	39.90	289	19.436	12	56.39	2	38.62	20	18.03	308	21.567	— 16	21.15	230
16.4	57.21	18	42.79	278	19.448	— 17	56.41	— 19	38.42	38	21.11	293	21.551	61	23.45	232
26.4	57.03	25	45.57	255	19.431	42	56.22	34	38.04	55	24.04	265	21.490	101	25.77	224
Nov. 5.4	56.78	31	48.12	223	19.389	65	55.88	47	37.49	67	26.69	228	21.389	135	28.01	206
15.4	56.47	37	50.35	181	19.324	81	55.41	58	36.82	79	28.97	180	21.254	162	30.07	182
25.3	56.10	40	52.16	132	19.243	95	54.83	66	36.03	88	30.77	126	21.092	182	31.89	148
Dec. 5.3	55.70	43	53.48	78	19.148	106	54.17	73	35.15	93	32.03	66	20.910	194	33.37	111
15.3	55.27	43	54.26	20	19.042	112	53.44	74	34.22	95	32.69	3	20.716	201	34.48	68
25.3	54.84	43	54.46	— 39	18.930	115	52.70	74	33.27	95	32.72	— 59	20.515	200	35.16	24
35.2	54.41		54.07		18.815		51.96		32.32		32.13		20.315		35.40	
Mean Place	51.774		61.61		14.985		28.06		31.014		37.54		17.060		45.11	
Sec δ, Tan δ	2.397		−2.179		1.000		+0.026		4.697		−4.589		1.362		−0.924	
$D_\psi a$, $D_\omega a$	+0.06		+0.15		+0.06		0.00		+0.05		+0.31		+0.06		+0.06	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.1		+0.4		+0.1		+0.4		+0.1		+0.4		+0.1	

Washington Mean Time.	12 Ceti. Mag. 6.0				13 Ceti. Mag. 5.2				ζ Cassiopeiæ. Mag. 3.7				π Andromedæ. Mag. 4.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	0 25		− 4 23		0 31		− 4 1		0 32		+53 27		0 32		+33 16	
	s		″		s		″		s		″		s		″	
Jan. 0.2	55.276	114	73.43	66	5.678	115	75.23	67	28.440	256	26.52	50	34.218	154	41.40	73
10.2	55.162	112	74.09	56	5.563	112	75.90	58	28.184	256	26.02	99	34.064	154	40.67	101
20.2	55.050	105	74.65	44	5.451	106	76.48	45	27.928	245	25.03	142	33.910	148	39.66	130
30.2	54.945	93	75.09	29	5.345	95	76.93	32	27.683	221	23.61	183	33.762	133	38.36	150
Feb. 9.1	54.852	74	75.38	13	5.250	78	77.25	14	27.462	187	21.78	214	33.629	111	36.86	167
19.1	54.778	53	75.51	— 6	5.172	56	77.39	— 4	27.275	141	19.64	236	33.518	82	35.19	173
Mar. 1.1	54.725	24	75.45	27	5.116	28	77.35	25	27.134	86	17.28	248	33.436	47	33.46	174
11.1	54.701	— 9	75.18	49	5.088	— 3	77.10	47	27.048	24	14.80	250	33.389	4	31.72	165
21.0	54.710	45	74.69	73	5.091	41	76.63	70	27.024	— 45	12.30	242	33.385	— 45	30.07	149
31.0	54.755	85	73.96	97	5.132	81	75.93	94	27.069	114	9.88	223	33.430	95	28.58	126
Apr. 10.0	54.840	126	72.99	121	5.213	122	74.99	119	27.183	186	7.65	195	33.525	145	27.32	97
19.9	54.966	167	71.78	143	5.335	162	73.80	140	27.369	252	5.70	160	33.670	192	26.35	62
29.9	55.133	204	70.35	165	5.497	201	72.40	162	27.621	314	4.10	118	33.862	239	25.73	25
May 9.9	55.337	238	68.70	180	5.698	234	70.78	179	27.935	365	2.92	72	34.101	277	25.48	— 15
19.9	55.575	267	66.90	194	5.932	265	68.99	192	28.300	408	2.20	24	34.378	312	25.63	54
29.8	55.842	289	64.96	202	6.197	287	67.07	200	28.708	439	1.96	— 25	34.690	335	26.17	91
June 8.8	56.131	305	62.94	205	6.484	304	65.07	204	29.147	458	2.21	73	35.025	352	27.08	129
18.8	56.436	310	60.89	202	6.788	311	63.03	203	29.605	464	2.94	120	35.377	358	28.37	161
28.8	56.746	309	58.87	196	7.099	310	61.00	196	30.069	460	4.14	163	35.735	353	29.98	188
July 8.7	57.055	298	56.91	182	7.409	300	59.04	184	30.529	442	5.77	202	36.088	343	31.86	212
18.7	57.353	283	55.09	165	7.709	285	57.20	165	30.971	416	7.79	235	36.431	322	33.98	230
28.7	57.636	258	53.44	144	7.994	261	55.55	146	31.387	381	10.14	264	36.753	295	36.28	242
Aug. 7.6	57.894	230	52.00	119	8.255	234	54.09	121	31.768	337	12.78	285	37.048	262	38.70	248
17.6	58.124	195	50.81	94	8.489	200	52.88	95	32.105	290	15.63	302	37.310	226	41.18	250
27.6	58.319	159	49.87	64	8.689	165	51.93	67	32.395	237	18.65	311	37.536	187	43.68	246
Sept. 6.6	58.478	122	49.23	38	8.854	128	51.26	40	32.632	183	21.76	314	37.723	145	46.14	238
16.5	58.600	85	48.85	11	8.982	91	50.86	13	32.815	128	24.90	311	37.868	104	48.52	225
26.5	58.685	50	48.74	— 14	9.073	54	50.73	— 11	32.943	74	28.01	302	37.972	65	50.77	207
Oct. 6.5	58.735	15	48.88	33	9.127	21	50.84	33	33.017	22	31.03	286	38.037	27	52.84	189
16.5	58.750	— 15	49.21	52	9.148	— 8	51.17	50	33.039	— 28	33.89	265	38.064	— 7	54.73	165
26.4	58.735	40	49.73	65	9.140	36	51.67	65	33.011	75	36.54	239	38.057	39	56.38	140
Nov. 5.4	58.695	63	50.38	76	9.104	57	52.32	76	32.936	119	38.93	206	38.018	68	57.78	110
15.4	58.632	81	51.14	82	9.047	77	53.08	81	32.817	158	40.99	167	37.950	93	58.88	80
25.3	58.551	95	51.96	83	8.970	92	53.89	83	32.659	191	42.66	126	37.857	114	59.68	49
Dec. 5.3	58.456	106	52.79	83	8.878	103	54.72	83	32.468	222	43.92	78	37.743	132	60.17	14
15.3	58.350	114	53.62	79	8.775	112	55.55	80	32.246	242	44.70	30	37.611	146	60.31	— 20
25.3	58.236	118	54.41	72	8.663	116	56.35	73	32.004	258	45.00	— 21	37.465	155	60.11	55
35.2	58.118		55.13		8.547		57.08		31.746		44.79		37.310		59.56	
Mean Place	54.320		76.81		4.690		78.65		27.051		4.75		33.017		25.15	
Sec δ, Tan δ	1.003		−0.077		1.002		−0.070		1.680		+1.349		1.196		+0.656	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		+0.01		+0.06		0.00		+0.07		−0.09		+0.06		−0.04	
$D_\psi\delta$, $D_\omega\delta$	+0.4		+0.1		+0.4		+0.1		+0.4		+0.1		+0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Cassiopeiæ. Mag. 3.6				δ Piscium. Mag. 4.6				λ Hydri. Mag. 5.0				20 Ceti. Mag. 4.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 0 44		° ′ +57 23		h m 0 44		° ′ + 7 8		h m 0 45		° ′ −75 21		h m 0 48		° ′ − 1 34	
	s		″		s		″		s		″		s		″	
Jan. 0.3	13.030		36.35		29.818		47.37		47.56		64.45		53.109		57.36	
10.2	12.740	290	36.03	32	29.702	116	46.64	73	46.76	80	63.87	58	52.991	118	58.06	70
20.2	12.448	292	35.20	83	29.585	117	45.88	76	45.98	78	62.69	118	52.874	117	58.69	63
30.2	12.165	283	33.88	132	29.471	114	45.13	75	45.27	71	60.95	174	52.759	115	59.23	54
Feb. 9.1	11.907	258	32.15	173	29.366	105	44.41	72	44.61	66	58.69	226	52.653	106	59.64	41
19.1	11.685	222	30.05	210	29.275	91	43.77	64	44.04	57	55.98	271	52.561	92	59.90	26
Mar. 1.1	11.510	175	27.68	237	29.207	68	43.23	54	43.58	46	52.89	309	52.489	72	60.00	10
11.1	11.393	117	25.12	256	29.164	43	42.84	39	43.22	36	49.50	339	52.443	46	59.91	9
21.0	11.346	47	22.51	261	29.156	8	42.64	20	43.00	22	45.90	360	52.430	13	59.59	32
31.0	11.372	26	19.95	256	29.185	29	42.64	0	42.89	11	42.17	373	52.453	23	59.06	53
Apr. 10.0	11.478	106	17.53	242	29.254	69	42.90	26	42.92	3	38.38	379	52.515	62	58.27	79
20.0	11.662	184	15.36	217	29.366	112	43.41	51	43.10	18	34.62	376	52.619	104	57.25	102
29.9	11.920	258	13.51	185	29.520	154	44.18	77	43.39	29	30.97	365	52.765	146	55.99	126
May 9.9	12.248	328	12.06	145	29.715	195	45.22	104	43.82	43	27.51	346	52.950	185	54.52	147
19.9	12.636	388	11.06	100	29.945	230	46.51	129	44.36	54	24.32	319	53.173	223	52.85	167
29.8	13.073	437	10.54	52	30.207	262	48.02	151	45.02	66	21.46	286	53.427	254	51.02	183
June 8.8	13.545	472	10.51	3	30.492	285	49.72	170	45.76	74	19.01	245	53.706	279	49.09	193
18.8	14.043	498	10.98	47	30.796	304	51.55	183	46.58	82	17.01	200	54.003	297	47.09	200
28.8	14.551	508	11.94	96	31.108	312	53.47	192	47.44	86	15.53	148	54.311	308	45.08	201
July 8.7	15.057	506	13.34	140	31.421	313	55.44	197	48.32	88	14.60	93	54.621	310	43.12	196
18.7	15.547	490	15.18	184	31.726	305	57.40	196	49.22	90	14.24	36	54.924	303	41.24	188
28.7	16.013	466	17.38	220	32.017	291	59.30	190	50.09	87	14.47	23	55.214	290	39.51	173
Aug. 7.7	16.442	429	19.90	252	32.287	270	61.09	179	50.90	81	15.27	80	55.484	270	37.97	154
17.6	16.828	386	22.68	278	32.528	241	62.72	163	51.64	74	16.63	136	55.727	243	36.65	132
27.6	17.164	336	25.66	298	32.738	210	64.18	146	52.29	65	18.49	186	55.940	213	35.58	107
Sept. 6.6	17.444	280	28.78	312	32.915	178	65.42	124	52.80	51	20.80	231	56.118	178	34.78	80
16.5	17.666	222	31.96	318	33.056	141	66.45	103	53.18	38	23.49	269	56.262	144	34.24	54
26.5	17.830	164	35.15	319	33.161	105	67.23	78	53.41	23	26.43	294	56.370	108	33.98	26
Oct. 6.5	17.935	105	38.29	314	33.231	70	67.79	56	53.48	7	29.54	311	56.442	72	33.95	3
16.5	17.980	45	41.30	301	33.269	38	68.13	34	53.39	9	32.69	315	56.482	40	34.16	21
26.4	17.970	10	44.13	283	33.276	7	68.25	12	53.16	23	35.75	306	56.490	8	34.55	39
Nov. 5.4	17.907	63	46.71	258	33.256	20	68.20	5	52.77	39	38.61	286	56.471	19	35.09	54
15.4	17.794	113	48.98	227	33.212	44	67.97	23	52.26	51	41.15	254	56.429	42	35.76	67
25.4	17.633	161	50.90	192	33.147	65	67.61	36	51.64	62	43.28	213	56.364	65	36.51	75
Dec. 5.3	17.430	203	52.38	148	33.065	82	67.13	48	50.93	71	44.90	162	56.282	82	37.31	80
15.3	17.193	237	53.40	102	32.970	95	66.54	59	50.17	76	45.96	106	56.186	96	38.12	81
25.3	16.926	267	53.92	52	32.861	109	65.88	66	49.37	80	46.40	44	56.078	108	38.91	79
35.2	16.639	287	53.91	1	32.744	117	65.16	72	48.56	81	46.24	16	55.961	117	39.68	77
Mean Place	11.422		13.95		28.692		40.23		47.458		50.28		52.004		61.29	
Sec δ, Tan δ	1.856		+1.563		1.008		+0.125		3.957		−3.828		1.000		−0.028	
$D_\psi a$, $D_\omega a$	+0.07		−0.10		+0.06		−0.01		+0.04		+0.26		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.2		+0.4		+0.2		+0.4		+0.2		+0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cassiopeiæ. Mag. 2.2				μ Andromedæ. Mag. 3.9				α Sculptoris. Mag. 4.4				ε Piscium. Mag. 4.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 0 51 s		° ′ +60 16 ″		h m 0 52 s		° ′ +38 3 ″		h m 0 54 s		° ′ −29 47 ″		h m 0 58 s		° ′ + 7 27 ″	
Jan. 0.3	50.22		65.10		16.515		54.18		43.131		48.33		45.470		22.52	
10.2	49.90	32	64.95	15	16.346	169	53.67	51	42.975	156	48.80	47	45.353	117	21.80	72
20.2	49.56	34	64.26	69	16.173	173	52.80	87	42.819	156	48.90	10 —	45.230	123	21.06	74
30.2	49.24	32	63.06	120	16.002	171	51.61	119	42.668	151	48.64	26	45.110	120	20.32	74
Feb. 9.2	48.94	30	61.40	166	15.844	158	50.16	145	42.528	140	48.02	62	44.997	113	19.63	69
19.1	48.67	27	59.34	206	15.704	140	48.49	167	42.406	122	47.05	97	44.896	101	18.99	64
Mar. 1.1	48.46	21	56.99	235	15.594	110	46.68	181	42.306	100	45.74	131	44.816	80	18.45	54
11.1	48.32	14	54.42	257	15.521	73	44.81	187	42.236	70	44.12	162	44.760	56	18.05	40
21.0	48.25	7	51.76	266	15.492	29 —	42.97	184	42.201	35 —	42.23	189	44.737	23 —	17.84	21
31.0	48.25	0	49.11	265	15.512	20	41.24	173	42.205	4	40.07	216	44.752	15	17.82	2 —
Apr. 10.0	48.34	9	46.60	251	15.586	74	39.70	154	42.252	47	37.71	236	44.807	55	18.04	22
20.0	48.52	18	44.29	231	15.714	128	38.42	128	42.344	92	35.17	254	44.905	98	18.51	47
29.9	48.78	26	42.30	199	15.896	182	37.45	97	42.483	139	32.52	265	45.046	141	19.25	74
May 9.9	49.11	33	40.69	161	16.128	232	36.85	60	42.666	183	29.81	271	45.228	182	20.24	99
19.9	49.52	41	39.52	117	16.405	277	36.64	21 —	42.891	225	27.08	273	45.449	221	21.48	124
29.9	49.98	46	38.82	70	16.720	315	36.83	19	43.152	261	24.41	267	45.702	253	22.93	145
June 8.8	50.48	50	38.63	19 —	17.064	344	37.43	60	43.444	292	21.87	254	45.981	279	24.58	165
18.8	51.00	52	38.93	30	17.428	364	38.40	97	43.759	315	19.50	237	46.280	299	26.37	179
28.8	51.54	54	39.73	80	17.802	374	39.75	135	44.088	329	17.38	212	46.590	310	28.26	189
July 8.7	52.08	54	41.01	128	18.176	374	41.42	167	44.423	335	15.55	183	46.902	312	30.19	193
18.7	52.61	53	42.72	171	18.542	366	43.35	193	44.755	332	14.08	147	47.209	307	32.12	193
28.7	53.11	50	44.83	211	18.890	348	45.53	218	45.075	320	12.99	109	47.505	296	34.00	188
Aug. 7.7	53.57	46	47.28	245	19.214	324	47.87	234	45.375	300	12.32	67	47.781	276	35.78	178
17.6	53.98	41	50.01	273	19.506	292	50.34	247	45.647	272	12.09	23 —	48.031	250	37.40	162
27.6	54.35	37	52.98	297	19.762	256	52.87	253	45.887	240	12.27	18	48.252	221	38.85	145
Sept. 6.6	54.67	32	56.11	313	19.979	217	55.42	255	46.088	201	12.88	61	48.441	189	40.09	124
16.6	54.92	25	59.34	323	20.156	177	57.93	251	46.249	161	13.85	97	48.596	155	41.12	103
26.5	55.10	18	62.60	326	20.291	135	60.36	243	46.366	117	15.17	132	48.715	119	41.90	78
Oct. 6.5	55.23	13	65.84	324	20.385	94	62.67	231	46.441	75	16.76	159	48.799	84	42.47	57
16.5	55.29	6	68.98	314	20.438	53	64.79	212	46.475	34 —	18.54	178	48.852	53	42.82	35
26.4	55.29	0	71.95	297	20.455	17 —	66.73	194	46.471	4	20.45	191	48.873	21 —	42.95	13 —
Nov. 5.4	55.23	6	74.71	276	20.435	20	68.42	169	46.431	40	22.40	195	48.867	6	42.91	4
15.4	55.10	13	77.15	244	20.383	52	69.84	142	46.361	70	24.31	191	48.835	32	42.69	22
25.4	54.93	17	79.25	210	20.301	82	70.95	111	46.265	96	26.09	178	48.782	53	42.34	35
Dec. 5.3	54.71	22	80.92	167	20.192	109	71.73	78	46.146	119	27.69	160	48.707	75	41.87	47
15.3	54.45	26	82.13	121	20.059	133	72.17	44	46.011	135	29.02	133	48.617	90	41.30	57
25.3	54.15	30	82.82	69	19.908	151	72.24	7 —	45.863	148	30.06	104	48.512	105	40.66	64
35.3	53.83	32	82.99	17	19.741	167	71.93	31	45.707	156	30.76	70	48.396	116	39.94	72
Mean Place	48.432		42.30		15.104		36.91		42.150		42.77		44.253		15.58	
Sec δ, Tan δ	2.017		+1.752		1.270		+0.783		1.152		−0.573		1.008		+0.131	
Dψα, Dωα	+0.07		−0.11		+0.07		−0.05		+0.06		+0.04		+0.06		−0.01	
Dψδ, Dωδ	+0.4		+0.2		+0.4		+0.2		+0.4		+0.2		+0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Phœnicis. Mag. 3.4				μ Cassiopeiæ. Mag. 5.3				η Ceti. Mag. 3.6				β Andromedæ. Mag. 2.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 2		−47 8		1 2		+54 31		1 4		−10 36		1 5		+35 11	
	s		″		s		″		s		″		s		″	
Jan. 0.3	29.074	234	79.71	27	53.935	250	46.49	19	32.041	122	39.93	70	12.955	157	45.16	45
10.2	28.840	233	79.98 —	23	53.685	260	46.30	68	31.919	125	40.63	54	12.798	166	44.71	78
20.2	28.607	225	79.75	72	53.425	256	45.62	115	31.794	125	41.17	33	12.632	164	43.93	107
30.2	28.382	208	79.03	120	53.169	241	44.47	156	31.669	118	41.50	12	12.468	158	42.86	132
Feb. 9.2	28.174	186	77.83	163	52.928	214	42.91	192	31.551	106	41.62 —	10	12.310	141	41.54	151
19.1	27.988	156	76.20	204	52.714	174	40.99	222	31.445	86	41.52	33	12.169	116	40.03	166
Mar. 1.1	27.832	118	74.16	237	52.540	124	38.77	240	31.359	64	41.19	57	12.053	82	38.37	170
11.1	27.714	75	71.79	269	52.416	63	36.37	248	31.295	32	40.62	82	11.971	41	36.67	169
21.0	27.639	27	69.10	293	52.353 —	7	33.89	248	31.263 —	5	39.80	106	11.930 —	7	34.98	157
31.0	27.612 —	26	66.17	310	52.360	78	31.41	236	31.268	43	38.74	130	11.937	57	33.41	141
Apr. 10.0	27.638	83	63.07	323	52.438	152	29.05	214	31.311	86	37.44	152	11.994	110	32.00	116
20.0	27.721	137	59.84	328	52.590	224	26.91	186	31.397	129	35.92	173	12.104	163	30.84	88
29.9	27.858	193	56.56	325	52.814	292	25.05	149	31.526	170	34.19	190	12.267	213	29.96	53
May 9.9	28.051	244	53.31	317	53.106	351	23.56	108	31.696	209	32.29	204	12.480	258	29.43	16
19.9	28.295	290	50.14	298	53.457	402	22.48	63	31.905	243	30.25	214	12.738	297	29.27 —	22
29.9	28.585	330	47.16	277	53.859	442	21.85	16	32.148	271	28.11	217	13.035	327	29.49	59
June 8.8	28.915	361	44.39	244	54.301	470	21.69 —	31	32.419	293	25.94	216	13.362	350	30.08	95
18.8	29.276	382	41.95	209	54.771	483	22.00	78	32.712	306	23.78	209	13.712	362	31.03	129
28.8	29.658	394	39.86	166	55.254	488	22.78	121	33.018	311	21.69	197	14.074	365	32.32	159
July 8.7	30.052	394	38.20	120	55.742	479	23.99	162	33.329	307	19.72	179	14.439	360	33.91	184
18.7	30.446	384	37.00	68	56.221	460	25.61	198	33.636	298	17.93	156	14.799	344	35.75	206
28.7	30.830	363	36.32	18	56.681	430	27.59	229	33.934	281	16.37	130	15.143	323	37.81	222
Aug. 7.7	31.193	333	36.14 —	34	57.111	394	29.88	256	34.215	255	15.07	101	15.466	295	40.03	232
17.6	31.526	293	36.48	85	57.505	351	32.44	275	34.470	227	14.06	68	15.761	262	42.35	237
27.6	31.819	248	37.33	132	57.856	302	35.19	290	34.697	194	13.38	36	16.023	225	44.72	238
Sept. 6.6	32.067	197	38.65	174	58.158	251	38.09	298	34.891	158	13.02	4	16.248	188	47.10	234
16.6	32.264	142	40.39	210	58.409	196	41.07	299	35.049	122	12.98 —	26	16.436	147	49.44	225
26.5	32.406	87	42.49	236	58.605	143	44.06	296	35.171	88	13.24	53	16.583	108	51.69	212
Oct. 6.5	32.493	33	44.85	255	58.748	89	47.02	287	35.259	52	13.77	76	16.691	70	53.81	197
16.5	32.526 —	21	47.40	263	58.837	36	49.89	271	35.311	20	14.53	95	16.761	33	55.78	178
26.4	32.505	69	50.03	258	58.873 —	15	52.60	248	35.331 —	8	15.48	107	16.794	0	57.56	155
Nov. 5.4	32.436	112	52.61	245	58.858	63	55.08	220	35.323	36	16.55	115	16.794	34	59.11	131
15.4	32.324	151	55.06	222	58.795	110	57.28	189	35.287	59	17.70	117	16.760	65	60.42	102
25.4	32.173	180	57.28	191	58.685	151	59.17	149	35.228	80	18.87	114	16.695	90	61.44	72
Dec. 5.3	31.993	206	59.19	151	58.534	189	60.66	106	35.148	96	20.01	108	16.605	116	62.16	41
15.3	31.787	223	60.70	108	58.345	219	61.72	61	35.052	109	21.09	96	16.489	137	62.57	6
25.3	31.564	232	61.78	59	58.126	246	62.33	12	34.943	121	22.05	81	16.352	153	62.63 —	27
35.3	31.332		62.37		57.880		62.45		34.822		22.86		16.199		62.36	
Mean Place	28.165		69.49		52.150		25.22		30.897		40.39		11.466		29.10	
Sec δ, Tan δ	1.470		−1.078		1.723		+1.403		1.017		−0.187		1.224		+0.705	
Dψα, Dωα	+0.05		+0.07		+0.07		−0.09		+0.06		+0.01		+0.07		−0.05	
Dψδ, Dωδ	+0.4		+0.3		+0.4		+0.3		+0.4		+0.3		+0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Piscium. Mag. 4.7				ζ Piscium. Mag. 5.6				κ Tucanae. Mag. 5.0				f Piscium. Mag. 5.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 7		+29 39		1 9		+ 7 8		1 12		−69 17		1 13		+ 3 11	
	s		″		s		″		s		″		s		″	
Jan. 0.3	13.132		50.15		31.142		57.11		62.13		97.01		38.451		22.73	
		142		51		117		72		56		5		115		73
10.2	12.990		49.64		31.025		56.39		61.57		96.96		38.336		22.00	
		150		78		122		72		55		64		124		69
20.2	12.840		48.86		30.903		55.67		61.02		96.32		38.212		21.31	
		151		101		124		71		54		122		124		64
30.2	12.689		47.85		30.779		54.96		60.48		95.10		38.088		20.67	
		144		121		117		68		50		177		118		56
Feb. 9.2	12.545		46.64		30.662		54.28		59.98		93.33		37.970		20.11	
		130		136		107		61		44		226		110		48
19.1	12.415		45.28		30.555		53.67		59.54		91.07		37.860		19.63	
		107		144		89		51		39		269		91		32
Mar. 1.1	12.308		43.84		30.466		53.16		59.15		88.38		37.769		19.31	
		76		146		64		38		31		306		68		16
11.1	12.232		42.38		30.402		52.78		58.84		85.32		37.701		19.15	—
		39		141		32		20		23		332		37		3
21.1	12.193	—	40.97		30.370	—	52.58		58.61		82.00		37.664	—	19.18	
		5		130		4		1		13		355		1		21
31.0	12.198		39.67		30.374		52.57	—	58.48		78.45		37.665		19.39	
		53		110		44		23		5		367		37		47
Apr. 10.0	12.251		38.57		30.418		52.80		58.43	—	74.78		37.702		19.86	
		103		86		87		47		6		373		80		70
20.0	12.354		37.71		30.505		53.27		58.49		71.05		37.782		20.56	
		152		57		131		73		15		370		126		95
29.9	12.506		37.14		30.636		54.00		58.64		67.35		37.908		21.51	
		201		25		173		97		27		357		167		118
May 9.9	12.707		36.89	—	30.809		54.97		58.91		63.78		38.075		22.69	
		243		10		212		123		35		340		204		140
19.9	12.950		36.99		31.021		56.20		59.26		60.38		38.279		24.09	
		280		44		247		143		43		313		242		160
29.9	13.230		37.43		31.268		57.63		59.69		57.25		38.521		25.69	
		311		80		274		162		51		280		269		175
June 8.8	13.541		38.23		31.542		59.25		60.20		54.45		38.790		27.44	
		332		112		294		176		57		237		290		186
18.8	13.873		39.35		31.836		61.01		60.77		52.08		39.080		29.30	
		344		140		309		186		62		191		302		190
28.8	14.217		40.75		32.145		62.87		61.39		50.17		39.382		31.20	
		348		167		312		190		65		139		309		192
July 8.8	14.565		42.42		32.457		64.77		62.04		48.78		39.691		33.12	
		343		188		309		191		66		84		307		190
18.7	14.908		44.30		32.766		66.68		62.70		47.94		39.998		35.02	
		331		203		298		185		66		26		298		179
28.7	15.239		46.33		33.064		68.53		63.36		47.68	—	40.296		36.81	
		308		215		281		175		63		34		280		165
Aug. 7.7	15.547		48.48		33.345		70.28		63.99		48.02		40.576		38.46	
		283		220		257		159		59		92		259		147
17.6	15.830		50.68		33.602		71.87		64.58		48.94		40.835		39.93	
		252		221		230		142		52		145		231		129
27.6	16.082		52.89		33.832		73.29		65.10		50.39		41.066		41.22	
		216		218		198		121		45		195		199		101
Sept. 6.6	16.298		55.07		34.030		74.50		65.55		52.34		41.265		42.28	
		180		208		164		100		35		238		167		79
16.6	16.478		57.15		34.194		75.50		65.90		54.72		41.432		43.02	
		144		198		131		75		24		275		133		52
26.5	16.622		59.13		34.325		76.25		66.14		57.47		41.565		43.54	
		105		183		96		53		14		299		98		31
Oct. 6.5	16.727		60.96		34.421		76.78		66.28		60.46		41.663		43.85	
		69		166		63		30		4		311		67		5
16.5	16.796		62.62		34.484		77.08		66.32	—	63.57		41.730		43.90	—
		35		147		32		11		8		314		36		16
26.5	16.831		64.09		34.516		77.19	—	66.24		66.71		41.766		43.74	
		3		123		5		7		20		302		6		30
Nov. 5.4	16.834	—	65.32		34.521	—	77.12		66.04		69.73		41.772	—	43.44	
		28		101		22		25		28		280		18		46
15.4	16.806		66.33		34.499		76.87		65.76		72.53		41.754		42.98	
		54		75		45		37		37		245		45		57
25.4	16.752		67.08		34.454		76.50		65.39		74.98		41.709		42.41	
		82		49		67		49		43		202		66		66
Dec. 5.3	16.670		67.57		34.387		76.01		64.96		77.00		41.643		41.75	
		103		20		85		58		49		152		83		73
15.3	16.567		67.77	—	34.302		75.43		64.47		78.52		41.560		41.02	
		122		7		100		65		53		95		100		72
25.3	16.445		67.70		34.202		74.78		63.94		79.47		41.460		40.30	
		139		36		114		71		56		35		113		73
35.3	16.306		67.34		34.088		74.07		63.38		79.82		41.347		39.57	
Mean Place	11.687		35.88		29.862		50.53		61.387		83.02		37.173		17.64	
Sec δ, Tan δ	1.151		+0.570		1.008		+0.125		2.830		−2.647		1.002		+0.056	
$D_\psi\alpha$, $D_\omega\alpha$	+0.07		−0.04		+0.06		−0.01		+0.04		+0.18		+0.06		0.00	
$D_\psi\delta$, $D_\omega\delta$	+0.4		+0.3		+0.4		+0.3		+0.4		+0.3		+0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	υ Piscium. Mag. 4.7				θ Ceti. Mag. 3.8				δ Cassiopeiæ. Mag. 2.8				γ Phœnicis. Mag. 3.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 15		+26 50		1 19		− 8 35		1 20		+59 48		1 24		−43 43	
	s		″		s		″		s		″		s		″	
Jan. 0.3	2.077		32.47		59.684		62.60		32.440		75.62		52.011		69.03	
10.3	1.941	136	31.97	50	59.563	121	63.36	76	32.131	309	75.79	17	51.795	216	69.61	58
20.2	1.796	145	31.23	74	59.435	128	63.97	61	31.806	325	75.44	35	51.574	221	69.70	9
30.2	1.649	147	30.29	94	59.305	130	64.39	42	31.478	328	74.57	87	51.355	219	69.31	39
Feb. 9.2	1.506	143	29.17	112	59.179	126	64.62	23	31.162	316	73.22	135	51.146	209	68.46	85
19.1	1.376	130	27.93	124	59.064	115	64.64	2	30.873	289	71.46	176	50.953	193	67.14	132
Mar. 1.1	1.266	110	26.62	131	58.964	100	64.43	21	30.627	246	69.34	212	50.785	168	65.41	173
11.1	1.186	80	25.31	131	58.888	76	64.00	43	30.438	189	66.97	237	50.647	138	63.31	210
21.1	1.141	45	24.05	126	58.841	47	63.32	68	30.317	121	64.44	253	50.549	98	60.89	242
31.0	1.138	3	22.92	113	58.830	11	62.41	91	30.274	43	61.87	257	50.495	54	58.18	271
Apr. 10.0	1.182	44	21.97	95	58.859	29	61.25	116	30.314	40	59.34	253	50.491	4	55.26	292
20.0	1.275	93	21.26	71	58.929	70	59.86	139	30.439	125	56.97	237	50.541	50	52.17	309
30.0	1.417	142	20.82	44	59.043	114	58.26	160	30.648	209	54.85	212	50.644	103	48.99	318
May 9.9	1.605	188	20.69	13	59.200	157	56.47	179	30.937	289	53.07	178	50.801	157	45.78	321
19.9	1.837	232	20.90	21	59.396	196	54.53	194	31.297	360	51.65	142	51.010	209	42.61	317
29.9	2.106	269	21.42	52	59.627	231	52.48	205	31.720	423	50.68	97	51.266	256	39.57	304
June 8.8	2.406	300	22.28	86	59.889	262	50.35	213	32.190	470	50.17	51	51.564	298	36.70	287
18.8	2.727	321	23.43	115	60.174	285	48.22	213	32.699	509	50.15	2	51.894	330	34.10	260
28.8	3.063	336	24.85	142	60.474	300	46.14	208	33.229	530	50.60	45	52.250	356	31.82	228
July 8.8	3.404	341	26.50	165	60.782	308	44.16	198	33.770	541	51.52	92	52.621	371	29.93	189
18.7	3.741	337	28.33	183	61.089	307	42.33	183	34.304	534	52.89	137	52.997	376	28.47	146
28.7	4.067	326	30.30	197	61.388	299	40.71	162	34.825	521	54.66	177	53.368	371	27.49	98
Aug. 7.7	4.374	307	32.36	206	61.672	284	39.33	138	35.317	492	56.79	213	53.722	354	27.03	46
17.7	4.657	283	34.45	209	61.933	261	38.24	109	35.771	454	59.22	243	54.053	331	27.08	5
27.6	4.909	252	36.53	208	62.169	236	37.45	79	36.182	411	61.92	270	54.351	298	27.64	56
Sept. 6.6	5.129	220	38.57	204	62.374	205	36.97	48	36.541	359	64.81	289	54.610	259	28.69	105
16.6	5.315	186	40.51	194	62.545	171	36.82	15	36.844	303	67.85	304	54.824	214	30.20	151
26.5	5.463	148	42.33	182	62.682	137	36.97	15	37.090	246	70.97	312	54.989	165	32.08	188
Oct. 6.5	5.575	112	43.99	166	62.785	103	37.39	42	37.273	183	74.10	313	55.104	115	34.30	222
16.5	5.653	78	45.48	149	62.853	68	38.06	67	37.395	122	77.18	308	55.169	65	36.74	244
26.5	5.697	44	46.78	130	62.889	36	38.91	85	37.457	62	80.15	297	55.183	14	39.32	258
Nov. 5.4	5.709	12	47.85	107	62.896	7	39.92	101	37.456	1	82.97	282	55.151	32	41.92	260
15.4	5.691	18	48.72	87	62.875	21	41.02	110	37.396	60	85.52	255	55.076	75	44.44	252
25.4	5.646	45	49.35	63	62.829	46	42.16	114	37.279	117	87.77	225	54.963	113	46.79	235
Dec. 5.4	5.575	71	49.74	39	62.761	68	43.29	113	37.108	171	89.66	189	54.817	146	48.87	208
15.3	5.480	95	49.87	13	62.674	87	44.37	108	36.887	221	91.12	146	54.642	175	50.60	173
25.3	5.365	115	49.75	12	62.570	104	45.36	99	36.623	264	92.11	99	54.447	195	51.93	133
35.3	5.234	131	49.39	36	62.452	118	46.23	87	36.326	297	92.59	48	54.235	212	52.82	89
Mean Place	0.602		19.32		58.440		63.43		30.250		53.84		50.929		59.31	
Sec δ, Tan δ	1.121		+0.506		1.011		−0.151		1.990		+1.720		1.384		−0.957	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		−0.03		+0.06		+0.01		+0.08		−0.11		+0.05		+0.06	
$D_\psi\delta$, $D_\omega\delta$	+0.4		+0.3		+0.4		+0.3		+0.4		+0.3		+0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	38 Cassiopeiæ. Mag. 6.0				η Piscium. Mag. 3.7				40 Cassiopeiæ. Mag. 5.5				υ Andromedæ. Mag. 4.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 25		+69 50		1 27		+14 55		1 31		+72 37		1 32		+41 0	
	s		″		s		″		s		″		s		″	
Jan. 0.3	13.55	49	77.43	46	10.197	120	52.11	61	64.15	57	63.96	62	3.974	172	19.85	15
10.3	13.06	52	77.89	—12	10.077	129	51.50	72	63.58	62	64.58	2	3.802	186	19.70	50
20.2	12.54	52	77.77	70	9.948	133	50.78	78	62.96	62	64.60	—56	3.616	194	19.20	86
30.2	12.02	50	77.07	124	9.815	132	50.00	82	62.34	60	64.04	114	3.422	190	18.34	119
Feb. 9.2	11.52	46	75.83	174	9.683	122	49.18	85	61.74	55	62.90	165	3.232	178	17.15	144
19.1	11.06	40	74.09	216	9.561	106	48.33	81	61.19	48	61.25	211	3.054	155	15.71	166
Mar. 1.1	10.66	32	71.93	250	9.455	82	47.52	73	60.71	38	59.14	248	2.899	122	14.05	180
11.1	10.34	20	69.43	272	9.373	51	46.79	63	60.33	28	56.66	272	2.777	80	12.25	185
21.1	10.14	10	66.71	283	9.322	13	46.16	46	60.05	14	53.94	287	2.697	30	10.40	182
31.0	10.04	—2	63.88	283	9.309	—28	45.70	26	59.91	1	51.07	290	2.667	—24	8.58	171
Apr. 10.0	10.06	15	61.05	273	9.337	74	45.44	3	59.90	—14	48.17	281	2.691	82	6.87	154
20.0	10.21	26	58.32	251	9.411	119	45.41	—23	60.04	28	45.36	262	2.773	141	5.33	128
30.0	10.47	38	55.81	220	9.530	164	45.64	49	60.32	41	42.74	235	2.914	197	4.05	99
May 9.9	10.85	48	53.61	183	9.694	206	46.13	78	60.73	53	40.39	198	3.111	249	3.06	64
19.9	11.33	57	51.78	139	9.900	241	46.91	102	61.26	63	38.41	155	3.360	294	2.42	26
29.9	11.90	64	50.39	91	10.141	273	47.93	127	61.89	71	36.86	108	3.654	330	2.16	—13
June 8.8	12.54	69	49.48	41	10.414	295	49.20	146	62.60	78	35.78	58	3.984	361	2.29	50
18.8	13.23	74	49.07	—11	10.709	312	50.66	165	63.38	83	35.20	6	4.345	379	2.79	88
28.8	13.97	75	49.18	61	11.021	319	52.31	175	64.21	84	35.14	—45	4.724	387	3.67	121
July 8.8	14.72	74	49.79	111	11.340	318	54.06	183	65.05	85	35.59	97	5.111	387	4.88	153
18.7	15.46	71	50.90	157	11.658	308	55.89	186	65.90	82	36.56	144	5.498	377	6.41	180
28.7	16.17	69	52.47	200	11.966	294	57.75	184	66.72	79	38.00	186	5.875	359	8.21	201
Aug. 7.7	16.86	64	54.47	237	12.260	274	59.59	177	67.51	74	39.86	228	6.234	335	10.22	220
17.7	17.50	58	56.84	270	12.534	245	61.36	165	68.25	67	42.14	263	6.569	304	12.42	231
27.6	18.08	51	59.54	297	12.779	216	63.01	152	68.92	60	44.77	291	6.873	267	14.73	239
Sept. 6.6	18.59	43	62.51	317	12.995	186	64.53	135	69.52	51	47.68	316	7.140	232	17.12	241
16.6	19.02	35	65.68	332	13.181	150	65.88	115	70.03	42	50.84	332	7.372	190	19.53	238
26.5	19.37	26	69.00	339	13.331	118	67.03	97	70.45	31	54.16	343	7.562	150	21.91	233
Oct. 6.5	19.63	16	72.39	340	13.449	86	68.00	75	70.76	22	57.59	345	7.712	110	24.24	221
16.5	19.79	8	75.79	333	13.535	53	68.75	57	70.98	10	61.04	342	7.822	70	26.45	206
26.5	19.87	—1	79.12	318	13.588	24	69.32	37	71.08	0	64.46	330	7.892	32	28.51	189
Nov. 5.4	19.86	10	82.30	296	13.612	—4	69.69	19	71.08	11	67.76	309	7.924	—7	30.40	165
15.4	19.76	20	85.26	267	13.608	31	69.88	1	70.97	21	70.85	282	7.917	42	32.05	140
25.4	19.56	28	87.93	230	13.577	54	69.89	—13	70.76	32	73.67	245	7.875	78	33.45	111
Dec. 5.4	19.28	35	90.23	186	13.523	77	69.76	30	70.44	42	76.12	203	7.797	110	34.56	78
15.3	18.93	42	92.09	136	13.446	96	69.46	43	70.02	49	78.15	152	7.687	139	35.34	44
25.3	18.51	48	93.45	81	13.350	114	69.03	55	69.53	55	79.67	98	7.548	163	35.78	8
35.3	18.03		94.26		13.236		68.48		68.98		80.65		7.385		35.86	
Mean Place	10.654		54.15		8.748		43.29		60.786		40.60		2.169		3.03	
Sec δ, Tan δ	2.903		+2.726		1.035		+0.267		3.350		+3.198		1.325		+0.870	
$D_\psi\alpha$, $D_\omega\alpha$	+0.09		−0.18		+0.06		−0.02		+0.09		−0.20		+0.07		−0.05	
$D_\psi\delta$, $D_\omega\delta$	+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Piscium. Mag. 5.6				υ Persei. Mag. 3.8				α Eridani. (*Achernar.*) Mag. 0.6				ω Cassiopeiæ. Mag. 5.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 32		+11 43		1 33		+48 13		1 34		−57 38		1 36		+67 37	
	s		″		s		″		s		″		s		″	
Jan. 0.3	49.560		46.82		2.664		24.56		43.004		65.63		22.14		84.88	
10.3	49.444	116	46.18	64	2.458	206	24.59	3 —	42.670	334	66.11	48 —	21.70	44	85.43	55 —
20.2	49.317	127	45.47	71	2.235	223	24.19	40	42.329	341	66.04	7	21.24	46	85.40	3
30.2	49.185	132	44.74	73	2.006	229	23.37	82	41.992	337	65.40	64	20.78	46	84.82	58
Feb. 9.2	49.054	131	44.00	74	1.780	226	22.17	120	41.668	324	64.23	117	20.32	46	83.70	112
19.2	48.932	122	43.29	71	1.570	210	20.62	155	41.368	300	62.56	167	19.90	42	82.08	162
Mar. 1.1	48.823	109	42.62	67	1.385	185	18.81	181	41.101	267	60.42	214	19.53	37	80.04	204
11.1	48.737	86	42.04	58	1.240	145	16.81	200	40.877	224	57.89	253	19.23	30	77.66	238
21.1	48.682	55	41.59	45	1.144	96	14.69	212	40.704	173	55.02	287	19.02	21	75.04	262
31.0	48.664	18 —	41.32	27	1.105	39 —	12.58	211	40.590	114	51.86	316	18.91	11	72.29	275
Apr. 10.0	48.686	22	41.24	8 —	1.126	21	10.52	206	40.540	50 —	48.50	336	18.90	1 —	69.53	276
20.0	48.752	66	41.41	17	1.215	89	8.62	190	40.557	17	44.99	351	19.02	12	66.85	268
30.0	48.863	111	41.81	40	1.368	153	6.98	164	40.647	90	41.44	355	19.24	22	64.38	247
May 9.9	49.018	155	42.48	67	1.584	216	5.63	135	40.805	158	37.91	353	19.56	32	62.19	219
19.9	49.215	197	43.39	91	1.857	273	4.64	99	41.033	228	34.47	344	19.98	42	60.34	185
29.9	49.449	234	44.55	116	2.182	325	4.05	59	41.322	289	31.21	326	20.50	52	58.92	142
June 8.9	49.715	266	45.91	136	2.548	366	3.87	18 —	41.668	346	28.21	300	21.07	57	57.96	96
18.8	50.004	289	47.45	154	2.946	398	4.11	24	42.061	393	25.54	267	21.70	63	57.49	47 —
28.8	50.310	306	49.15	170	3.365	419	4.77	66	42.491	430	23.26	228	22.35	65	57.52	3
July 8.8	50.624	314	50.93	178	3.793	428	5.82	105	42.946	455	21.43	183	23.04	69	58.04	52
18.7	50.938	314	52.76	183	4.221	428	7.22	140	43.413	467	20.12	131	23.73	69	59.05	101
28.7	51.244	306	54.58	182	4.639	418	8.96	174	43.880	467	19.34	78	24.40	67	60.51	146
Aug. 7.7	51.537	293	56.35	177	5.036	397	10.98	202	44.332	452	19.14	20 —	25.04	64	62.37	186
17.7	51.810	273	58.02	167	5.408	372	13.23	225	44.758	426	19.50	36	25.64	60	64.62	225
27.6	52.057	247	59.56	154	5.745	337	15.67	244	45.147	389	20.44	94	26.20	56	67.20	258
Sept. 6.6	52.275	218	60.94	138	6.044	299	18.24	257	45.486	339	21.90	146	26.68	48	70.04	284
16.6	52.462	187	62.11	117	6.302	258	20.88	264	45.767	281	23.83	193	27.10	42	73.10	306
26.6	52.615	153	63.09	98	6.515	213	23.54	266	45.985	218	26.18	235	27.45	35	76.30	320
Oct. 6.5	52.736	121	63.85	76	6.683	168	26.19	265	46.134	149	28.85	267	27.72	27	79.58	328
16.5	52.826	90	64.41	56	6.805	122	28.75	256	46.213	79	31.74	289	27.92	20	82.90	332
26.5	52.884	58	64.77	36	6.882	77	31.20	245	46.221	8 —	34.74	300	28.02	10	86.15	325
Nov. 5.4	52.912	28	64.93	16	6.914	32 —	33.47	227	46.161	60	37.74	300	28.04	2 —	89.27	312
15.4	52.913	1 —	64.93	0	6.902	12	35.51	204	46.039	122	40.61	287	27.98	6	92.20	293
25.4	52.887	26	64.78	15	6.847	55	37.29	178	45.860	179	43.23	262	27.84	14	94.85	265
Dec. 5.4	52.837	50	64.49	29	6.752	95	38.75	146	45.630	230	45.53	230	27.63	21	97.17	232
15.3	52.764	73	64.08	41	6.619	133	39.85	110	45.359	271	47.41	188	27.34	29	99.05	188
25.3	52.672	92	63.57	51	6.451	168	40.55	70	45.056	303	48.79	138	26.98	36	100.46	141
35.3	52.561	111	62.97	60	6.256	195	40.84	29	44.730	326	49.64	85	26.56	42	101.34	88
Mean Place	48.104		39.27		0.694		5.87		41.924		53.03		19.221		62.41	
Sec δ, Tan δ	1.021		+0.208		1.501		+1.119		1.869		−1.578		2.628		+2.431	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		−0.01		+0.07		−0.07		+0.04		+0.10		+0.09		−0.15	
$D_\psi\delta$, $D_\omega\delta$	+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Piscium. Mag. 4.7				φ Persei. Mag. 4.2				τ Ceti. Mag. 3.6				o Piscium. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 37		+ 5 4		1 38		+50 16		1 40		−16 21		1 41		+ 8 45	
	s		″		s		″		s		″		s		″	
Jan. 0.3	14.288		46.62		36.539		71.46		19.563		51.10		8.331		8.09	
10.3	14.175	113	45.91	71	36.322	217	71.60	14	19.431	132	51.90	80	8.217	114	7.43	66
20.2	14.051	124	45.23	68	36.087	235	71.29	31	19.289	142	52.47	57	8.092	125	6.73	70
30.2	13.920	131	44.58	65	35.843	244	70.54	75	19.143	146	52.76	29	7.960	132	6.05	68
Feb. 9.2	13.790	130	43.98	60	35.602	241	69.39	115	18.997	146	52.78	2	7.827	133	5.38	67
19.2	13.667	123	43.47	51	35.375	227	67.88	151	18.860	137	52.51	27	7.700	127	4.76	62
Mar. 1.1	13.558	109	43.07	40	35.176	199	66.08	180	18.739	121	51.97	54	7.588	112	4.22	54
11.1	13.470	88	42.82	25	35.016	160	64.06	202	18.638	101	51.13	84	7.497	91	3.79	43
21.1	13.412	58	42.72	10	34.906	110	61.90	216	18.567	71	50.03	110	7.435	62	3.51	28
31.0	13.388	24	42.83	11	34.855	51	59.70	220	18.531	36	48.66	137	7.408	27	3.40	11
Apr. 10.0	13.404	16	43.15	32	34.868	13	57.58	212	18.535	4	47.04	162	7.422	14	3.49	9
20.0	13.463	59	43.70	55	34.949	81	55.58	200	18.580	45	45.20	184	7.479	57	3.82	33
30.0	13.566	103	44.50	80	35.100	151	53.82	176	18.671	91	43.16	204	7.581	102	4.39	57
May 9.9	13.713	147	45.51	101	35.315	215	52.35	147	18.807	136	40.97	219	7.727	146	5.21	82
19.9	13.900	187	46.78	127	35.591	276	51.23	112	18.984	177	38.66	231	7.915	188	6.25	104
29.9	14.126	226	48.22	144	35.922	331	50.50	73	19.200	216	36.28	238	8.140	225	7.52	127
June 8.9	14.383	257	49.85	163	36.295	373	50.18	32	19.449	249	33.90	238	8.398	258	8.98	146
18.8	14.664	281	51.60	175	36.703	408	50.30	12	19.723	274	31.56	234	8.681	283	10.61	163
28.8	14.962	298	53.42	182	37.134	431	50.83	53	20.017	294	29.32	224	8.981	300	12.34	173
July 8.8	15.271	309	55.28	186	37.576	442	51.76	93	20.323	306	27.26	206	9.291	310	14.13	179
18.7	15.581	310	57.13	185	38.020	444	53.07	131	20.632	309	25.42	184	9.603	312	15.95	182
28.7	15.883	302	58.91	178	38.454	434	54.73	166	20.934	302	23.86	156	9.908	305	17.74	179
Aug. 7.7	16.173	290	60.56	165	38.870	416	56.68	195	21.225	291	22.61	125	10.201	293	19.44	170
17.7	16.444	271	62.06	150	39.258	388	58.90	222	21.498	273	21.70	91	10.476	275	21.02	158
27.6	16.689	245	63.37	131	39.614	356	61.31	241	21.744	246	21.17	53	10.726	250	22.44	142
Sept. 6.6	16.907	218	64.45	108	39.930	316	63.89	258	21.962	218	21.01	16	10.948	222	23.66	122
16.6	17.095	188	65.30	85	40.204	274	66.56	267	22.148	186	21.23	22	11.142	194	24.69	103
26.6	17.249	154	65.90	60	40.433	229	69.27	271	22.298	150	21.77	54	11.302	160	25.48	79
Oct. 6.5	17.372	123	66.27	37	40.616	183	71.97	270	22.414	116	22.63	86	11.430	128	26.06	58
16.5	17.463	91	66.41	14	40.751	135	74.63	266	22.494	80	23.76	113	11.528	98	26.43	37
26.5	17.523	60	66.35	6	40.838	87	77.16	253	22.541	47	25.08	132	11.593	65	26.58	15
Nov. 5.4	17.553	30	66.11	24	40.878	40	79.54	238	22.555	14	26.54	146	11.630	37	26.56	2
15.4	17.556	3	65.72	39	40.871	7	81.70	216	22.539	16	28.06	152	11.638	8	26.38	18
25.4	17.532	24	65.21	51	40.820	51	83.60	190	22.496	43	29.59	153	11.619	19	26.06	32
Dec. 5.4	17.485	47	64.61	60	40.726	94	85.18	158	22.427	69	31.06	147	11.576	43	25.64	42
15.3	17.415	70	63.95	66	40.589	137	86.41	123	22.337	90	32.40	134	11.508	68	25.12	52
25.3	17.325	90	63.24	71	40.416	173	87.24	83	22.225	112	33.57	117	11.420	88	24.52	60
35.3	17.218	107	62.53	71	40.212	204	87.64	40	22.099	126	34.55	98	11.314	106	23.88	64
Mean Place	12.857		41.50		34.455		52.51		18.268		48.80		6.847		1.80	
Sec δ, Tan δ	1.004		+0.089		1.565		+1.204		1.042		−0.294		1.012		+0.154	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		−0.01		+0.07		−0.07		+0.06		+0.02		+0.06		−0.01	
$D_\psi\delta$, $D_\omega\delta$	+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Sculptoris. Mag. 5.4 Right Ascension.		ε Sculptoris. Mag. 5.4 Declination.		ζ Ceti. Mag. 3.9 Right Ascension.		ζ Ceti. Mag. 3.9 Declination.		α Trianguli. Mag. 3.6 Right Ascension.		α Trianguli. Mag. 3.6 Declination.		ε Cassiopeiæ. Mag. 3.4 Right Ascension.		ε Cassiopeiæ. Mag. 3.4 Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 41		−25 26		1 47		−10 43		1 48		+29 11		1 48		+63 16	
	s		″		s		″		s		″		s		″	
Jan. 0.3	52.176	146	89.74	87	29.090	120	65.18	87	29.321	132	18.06	29	35.85	34	40.01	58
10.3	52.030	156	90.61	53	28.970	132	66.05	66	29.189	149	17.77	52	35.51	37	40.59	4
20.2	51.874	160	91.14	18	28.838	139	66.71	47	29.040	158	17.25	76	35.14	39	40.63	49
30.2	51.714	160	91.32	17	28.699	140	67.18	24	28.882	161	16.49	94	34.75	38	40.14	101
Feb. 9.2	51.554	151	91.15	52	28.559	134	67.42	1	28.721	154	15.55	112	34.37	36	39.13	148
19.2	51.403	135	90.63	87	28.425	120	67.43	24	28.567	139	14.43	123	34.01	32	37.65	188
Mar. 1.1	51.268	111	89.76	120	28.305	101	67.19	48	28.428	113	13.20	129	33.69	26	35.77	222
11.1	51.157	82	88.56	153	28.204	73	66.71	75	28.315	79	11.91	128	33.43	19	33.55	246
21.1	51.075	47	87.03	179	28.131	39	65.96	98	28.236	39	10.63	122	33.24	11	31.09	259
31.1	51.028	5	85.24	205	28.092	1	64.98	125	28.197	7	9.41	110	33.13	2	28.50	261
Apr. 10.0	51.023	40	83.19	226	28.091	42	63.73	146	28.204	58	8.31	91	33.11	7	25.89	253
20.0	51.063	84	80.93	245	28.133	86	62.27	169	28.262	109	7.40	67	33.18	17	23.36	236
30.0	51.147	133	78.48	258	28.219	130	60.58	187	28.371	159	6.73	41	33.35	27	21.00	210
May 9.9	51.280	177	75.90	266	28.349	173	58.71	202	28.530	207	6.32	9	33.62	35	18.90	176
19.9	51.457	218	73.24	266	28.521	211	56.69	214	28.737	249	6.23	21	33.97	42	17.14	137
29.9	51.675	254	70.58	262	28.732	244	54.55	219	28.986	284	6.44	52	34.39	48	15.77	94
June 8.9	51.929	281	67.96	250	28.976	270	52.36	219	29.270	313	6.96	82	34.87	54	14.83	47
18.8	52.210	305	65.46	233	29.246	291	50.17	214	29.583	332	7.78	111	35.41	57	14.36	0
28.8	52.515	317	63.13	209	29.537	304	48.03	203	29.915	344	8.89	134	35.98	59	14.36	47
July 8.8	52.832	321	61.04	179	29.841	307	46.00	187	30.259	346	10.23	157	36.57	59	14.83	93
18.8	53.153	319	59.25	145	30.148	302	44.13	164	30.605	340	11.80	172	37.16	59	15.76	136
28.7	53.472	307	57.80	106	30.450	293	42.49	139	30.945	328	13.52	184	37.75	57	17.12	176
Aug. 7.7	53.779	289	56.74	64	30.743	276	41.10	108	31.273	307	15.36	192	38.32	54	18.88	212
17.7	54.068	263	56.10	22	31.019	252	40.02	75	31.580	283	17.28	194	38.86	49	21.00	242
27.6	54.331	235	55.88	22	31.271	226	39.27	42	31.863	253	19.22	194	39.35	45	23.42	268
Sept. 6.6	54.566	199	56.10	64	31.497	195	38.85	7	32.116	222	21.16	188	39.80	39	26.10	287
16.6	54.765	163	56.74	102	31.692	162	38.78	25	32.338	189	23.04	180	40.19	32	28.97	303
26.6	54.928	125	57.76	134	31.854	128	39.03	54	32.527	153	24.84	167	40.51	26	32.00	310
Oct. 6.5	55.053	87	59.10	162	31.982	97	39.57	82	32.680	118	26.51	155	40.77	20	35.10	313
16.5	55.140	51	60.72	180	32.079	63	40.39	102	32.798	85	28.06	139	40.97	13	38.23	307
26.5	55.191	15	62.52	194	32.142	32	41.41	119	32.883	52	29.45	119	41.10	6	41.30	296
Nov. 5.5	55.206	18	64.46	196	32.174	4	42.60	128	32.935	18	30.64	101	41.16	1	44.26	279
15.4	55.188	49	66.42	193	32.178	26	43.88	133	32.953	13	31.65	82	41.15	8	47.05	253
25.4	55.139	77	68.35	180	32.152	50	45.21	130	32.940	44	32.47	59	41.07	16	49.58	221
Dec. 5.4	55.062	100	70.15	161	32.102	75	46.51	125	32.896	73	33.06	36	40.91	21	51.79	183
15.3	54.962	124	71.76	137	32.027	94	47.76	112	32.823	99	33.42	10	40.70	27	53.62	138
25.3	54.838	139	73.13	108	31.933	114	48.88	99	32.724	125	33.52	14	40.43	32	55.00	90
35.3	54.699		74.21		31.819		49.87		32.599		33.38		40.11		55.90	
Mean Place	50.899		84.73		27.704		64.71		27.574		5.34		33.062		18.86	
Sec δ, Tan δ	1.108		−0.476		1.018		−0.190		1.145		+0.559		2.224		+1.986	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.06		+0.03		+0.06		+0.01		+0.07		−0.03		+0.08		−0.12	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		+0.4		+0.4		+0.5		+0.4		+0.5		+0.4		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**ξ Piscium.** Mag. 4.8				**β Arietis.** Mag. 2.7				**ψ Phœnicis.** Mag. 4.4				**υ Ceti.** Mag. 4.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 1 49 s		° ′ + 2 47 ″		h m 1 50 s		° ′ +20 24 ″		h m 1 50 s		° ′ −46 41 ″		h m 1 56 s		° ′ −21 27 ″	
Jan. 0.3	23.115		21.42		11.325		55.25		25.049		68.14		12.645		75.11	
10.3	23.003	112	20.68	74	11.206	119	54.80	45	24.816	233	68.97	83	12.510	135	76.08	97
20.2	22.879	124	19.99	69	11.072	134	54.20	60	24.570	246	69.30	33	12.362	148	76.74	66
30.2	22.747	132	19.36	63	10.929	143	53.46	74	24.321	249	69.12	18	12.207	155	77.09	35
Feb. 9.2	22.612	135	18.82	54	10.783	146	52.62	84	24.076	245	68.43	69	12.049	158	77.11	2
19.2	22.482	130	18.38	44	10.642	141	51.71	91	23.843	233	67.26	117	11.897	152	76.80	31
Mar. 1.1	22.366	116	18.08	30	10.516	126	50.76	95	23.633	210	65.64	162	11.758	139	76.16	64
11.1	22.268	98	17.93	15	10.411	105	49.83	93	23.450	183	63.61	203	11.640	118	75.22	94
21.1	22.199	69	17.95	2	10.338	73	48.96	87	23.307	143	61.23	238	11.548	92	73.96	126
31.1	22.164	35	18.18	23	10.301	37	48.21	75	23.209	98	58.52	271	11.491	57	72.41	155
Apr. 10.0	22.167	3	18.63	45	10.308	7	47.61	60	23.162	47	55.56	296	11.474	17	70.61	180
20.0	22.213	46	19.30	67	10.360	52	47.21	40	23.170	8	52.42	314	11.500	26	68.57	204
30.0	22.303	90	20.21	91	10.461	101	47.06	15	23.235	65	49.15	327	11.572	72	66.34	223
May 9.9	22.438	135	21.34	113	10.608	147	47.17	11	23.357	122	45.83	332	11.690	118	63.95	239
19.9	22.615	177	22.68	134	10.801	193	47.54	37	23.537	180	42.52	331	11.853	163	61.45	250
29.9	22.830	215	24.21	153	11.033	232	48.20	66	23.769	232	39.32	320	12.057	204	58.90	255
June 8.9	23.078	248	25.90	169	11.300	267	49.11	91	24.048	279	36.29	303	12.296	239	56.36	254
18.8	23.351	273	27.68	178	11.593	293	50.26	115	24.367	319	33.50	279	12.566	270	53.90	246
28.8	23.643	292	29.54	186	11.906	313	51.62	136	24.718	351	31.04	246	12.858	292	51.56	234
July 8.8	23.948	305	31.40	186	12.229	323	53.16	154	25.089	371	28.95	209	13.166	308	49.44	212
18.8	24.255	307	33.24	184	12.556	327	54.83	167	25.472	383	27.32	163	13.481	315	47.55	189
28.7	24.558	303	34.98	174	12.878	322	56.58	175	25.857	385	26.17	115	13.793	312	45.99	156
Aug. 7.7	24.850	292	36.58	160	13.187	309	58.37	179	26.233	376	25.54	63	14.096	303	44.78	121
17.7	25.125	275	38.01	143	13.479	292	60.14	177	26.590	357	25.45	9	14.385	289	43.96	82
27.6	25.377	252	39.21	120	13.746	267	61.87	173	26.919	329	25.92	47	14.651	266	43.55	41
Sept. 6.6	25.604	227	40.19	98	13.987	241	63.50	163	27.211	292	26.90	98	14.891	240	43.55	0
16.6	25.800	196	40.91	72	14.197	210	65.02	152	27.461	250	28.38	148	15.098	207	43.96	41
26.6	25.965	165	41.38	47	14.376	179	66.40	138	27.663	202	30.28	190	15.272	174	44.75	79
Oct. 6.5	26.100	135	41.59	21	14.522	146	67.60	120	27.815	152	32.56	228	15.411	139	45.88	113
16.5	26.202	102	41.58	1	14.635	113	68.64	104	27.914	99	35.11	255	15.514	103	47.29	141
26.5	26.273	71	41.36	22	14.716	81	69.50	86	27.959	45	37.83	272	15.582	68	48.92	163
Nov. 5.5	26.315	42	40.96	40	14.767	51	70.17	67	27.954	5	40.62	279	15.615	33	50.70	178
15.4	26.328	13	40.43	53	14.787	20	70.67	50	27.900	54	43.36	274	15.616	1	52.54	184
25.4	26.314	14	39.78	65	14.778	9	70.99	32	27.802	98	45.95	259	15.586	30	54.38	184
Dec. 5.4	26.275	39	39.05	73	14.741	37	71.13	14	27.665	137	48.31	236	15.528	58	56.13	175
15.3	26.212	63	38.29	76	14.677	64	71.11	2	27.492	173	50.32	201	15.444	84	57.73	160
25.3	26.127	85	37.51	78	14.588	89	70.90	21	27.289	203	51.92	160	15.336	108	59.13	140
35.3	26.023	104	36.75	76	14.479	109	70.54	36	27.065	224	53.07	115	15.209	127	60.26	113
Mean Place	21.630		17.41		9.675		45.37		23.808		57.54		11.269		71.09	
Sec δ, Tan δ	1.001		+0.049		1.067		+0.372		1.458		−1.061		1.075		−0.393	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		0.00		+0.07		−0.02		+0.05		+0.06		+0.06		+0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.5		+0.4		+0.5		+0.4		+0.5		+0.3		+0.5	

APPARENT PLACES OF STARS, 1919.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*α* **Hydri.** Mag. 3.0				**50 Cassiopeiæ.** Mag. 4.1				*γ* **Andromedæ** *pr.* Mag. 2.3				*α* **Arietis.** Mag. 2.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 56		−61 57		1 56		+72 1		1 58		+41 56		2 2		+23 4	
	s		″		s		″		s		″		s		″	
Jan. 0.3	13.87		62.58		32.99		70.61		57.268		46.09		37.944		58.44	
10.3	13.47	40	63.30	72	32.46	53	71.51	90	57.103	165	46.20	11 —	37.826	118	58.10	34
20.3	13.06	41	63.43	13 —	31.89	57	71.85	34 —	56.917	186	45.94	26	37.690	136	57.58	52
30.2	12.65	41	62.97	46	31.29	60	71.60	25	56.717	200	45.33	61	37.542	148	56.90	68
Feb. 9.2	12.25	40	61.96	101	30.69	60	70.77	83	56.514	203	44.39	94	37.389	153	56.09	81
19.2	11.87	38	60.41	155	30.13	56	69.40	137	56.317	197	43.15	124	37.239	150	55.17	92
Mar. 1.1	11.52	35	58.38	203	29.62	51	67.55	185	56.137	180	41.67	148	37.101	138	54.19	98
11.1	11.21	31	55.92	246	29.20	42	65.30	225	55.987	150	40.01	166	36.986	115	53.19	100
21.1	10.96	25	53.09	283	28.87	33	62.74	256	55.876	111	38.25	176	36.899	87	52.22	97
31.1	10.78	18	49.94	315	28.66	21	59.99	275	55.813	63	36.46	179	36.849	50	51.34	88
Apr. 10.0	10.66	12	46.57	337	28.59	7 —	57.15	284	55.804	9 —	34.72	174	36.843	6 —	50.60	74
20.0	10.62	4 —	43.02	355	28.66	7	54.33	282	55.855	51	33.12	160	36.883	40	50.03	57
30.0	10.67	5	39.40	362	28.85	19	51.64	269	55.965	110	31.71	141	36.973	90	49.69	34
May 10.0	10.79	12	35.78	362	29.18	33	49.18	246	56.133	168	30.58	113	37.112	139	49.59	10 —
19.9	10.99	20	32.24	354	29.64	46	47.04	214	56.357	224	29.75	83	37.297	185	49.77	18
29.9	11.27	28	28.86	338	30.20	56	45.27	177	56.631	274	29.24	51	37.524	227	50.22	45
June 8.9	11.61	34	25.71	315	30.85	65	43.94	133	56.947	316	29.11	13 —	37.787	263	50.94	72
18.8	12.01	40	22.88	283	31.58	73	43.07	87	57.298	351	29.35	24	38.078	291	51.91	97
28.8	12.46	45	20.44	244	32.37	79	42.70	37 —	57.672	374	29.94	59	38.393	315	53.12	121
July 8.8	12.94	48	18.46	198	33.18	81	42.83	13	58.060	388	30.87	93	38.719	326	54.51	139
18.8	13.45	51	16.98	148	34.01	83	43.46	63	58.454	394	32.12	125	39.050	331	56.06	155
28.7	13.97	52	16.06	92	34.83	82	44.56	110	58.843	389	33.65	153	39.379	329	57.73	167
Aug. 7.7	14.48	51	15.72	34 —	35.63	80	46.12	156	59.221	378	35.42	177	39.698	319	59.45	172
17.7	14.97	49	15.96	24	36.39	76	48.09	197	59.577	356	37.37	195	39.999	301	61.20	175
27.7	15.42	45	16.80	84	37.10	71	50.42	233	59.909	332	39.49	212	40.279	280	62.93	173
Sept. 6.6	15.83	41	18.20	140	37.74	64	53.08	266	60.208	299	41.70	221	40.533	254	64.59	166
16.6	16.17	34	20.10	190	38.30	56	56.00	292	60.473	265	43.98	228	40.757	224	66.16	157
26.6	16.45	28	22.45	235	38.79	49	59.13	313	60.701	228	46.26	228	40.952	195	67.61	145
Oct. 6.5	16.66	21	25.17	272	39.17	38	62.40	327	60.892	191	48.51	225	41.113	161	68.93	132
16.5	16.77	11	28.15	298	39.47	30	65.74	334	61.041	149	50.70	219	41.242	129	70.08	115
26.5	16.82	5 —	31.27	312	39.67	20	69.10	336	61.151	110	52.77	207	41.340	98	71.07	99
Nov. 5.5	16.78	4	34.42	315	39.74	7 —	72.39	329	61.220	69	54.71	194	41.405	65	71.90	83
15.4	16.67	11	37.47	305	39.72	2	75.52	313	61.250	30 —	56.46	175	41.439	34	72.54	64
25.4	16.48	19	40.32	285	39.59	13	78.43	291	61.240	10	57.99	153	41.442	3 —	73.02	48
Dec. 5.4	16.23	25	42.84	252	39.36	23	81.04	261	61.192	48	59.26	127	41.415	27	73.31	29
15.4	15.93	30	44.95	211	39.03	33	83.26	222	61.105	87	60.25	99	41.360	55	73.43	12 —
25.3	15.58	35	46.57	162	38.60	43	85.02	176	60.984	121	60.91	66	41.276	84	73.36	7
35.3	15.20	38	47.64	107	38.10	50	86.26	124	60.831	153	61.22	31	41.169	107	73.11	25
Mean Place	12.608		49.28		29.160		48.57		55.208		30.18		36.182		48.20	
Sec *δ*, Tan *δ*	2.127		−1.878		3.242		+3.084		1.344		+0.899		1.087		+0.426	
$D_\psi\alpha$, $D_\omega\alpha$	+0.04		+0.11		+0.10		−0.18		+0.07		−0.05		+0.07		−0.02	
$D_\psi\delta$, $D_\omega\delta$	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Trianguli. Mag. 3.1				55 Cassiopeiæ. Mag. 6.2				6 Persei. Mag. 5.4				ξ¹ Ceti. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 2 4 s		° ′ +34 36 ″		h m 2 8 s		° ′ +66 8 ″		h m 2 8 s		° ′ +50 41 ″		h m 2 8 s		° ′ + 8 28 ″	
Jan. 0.3	45.043	138	30.81	4	9.62	37	64.78	88	14.907	202	42.46	44	43.905	106	7.32	65
10.3	44.905	160	30.77	33	9.25	41	65.66	35	14.705	228	42.90	0	43.799	124	6.67	66
20.3	44.745	173	30.44	62	8.84	43	66.01	20	14.477	247	42.90	43	43.675	135	6.01	65
30.2	44.572	179	29.82	87	8.41	44	65.81	74	14.230	252	42.47	85	43.540	141	5.36	62
Feb. 9.2	44.393	175	28.95	110	7.97	43	65.07	125	13.978	247	41.62	123	43.399	140	4.74	57
19.2	44.218	160	27.85	128	7.54	39	63.82	171	13.731	225	40.39	156	43.259	130	4.17	50
Mar. 1.1	44.058	136	26.57	139	7.15	33	62.11	209	13.506	194	38.83	181	43.129	111	3.67	40
11.1	43.922	102	25.18	146	6.82	26	60.02	237	13.312	148	37.02	201	43.018	85	3.27	25
21.1	43.820	60	23.72	144	6.56	17	57.65	257	13.164	92	35.01	211	42.933	54	3.02	10
31.1	43.760	12	22.28	137	6.39	7	55.08	266	13.072	30	32.90	210	42.879	14	2.92	8
Apr. 10.0	43.748	41	20.91	121	6.32	3	52.42	264	13.042	39	30.80	203	42.865	30	3.00	31
20.0	43.789	97	19.70	101	6.35	14	49.78	251	13.081	109	28.77	188	42.895	74	3.31	52
30.0	43.886	150	18.69	76	6.49	24	47.27	230	13.190	176	26.89	163	42.969	120	3.83	76
May 10.0	44.036	201	17.93	48	6.73	34	44.97	201	13.366	244	25.26	134	43.089	164	4.59	98
19.9	44.237	248	17.45	16	7.07	44	42.96	166	13.610	301	23.92	98	43.253	204	5.57	119
29.9	44.485	287	17.29	17	7.51	51	41.30	124	13.911	352	22.94	61	43.457	238	6.76	137
June 8.9	44.772	320	17.46	48	8.02	56	40.06	80	14.263	392	22.33	22	43.695	268	8.13	153
18.8	45.092	342	17.94	80	8.58	61	39.26	34	14.655	422	22.11	19	43.963	289	9.66	165
28.8	45.434	358	18.74	108	9.19	64	38.92	14	15.077	443	22.30	57	44.252	304	11.31	171
July 8.8	45.792	363	19.82	133	9.83	65	39.06	60	15.520	449	22.87	96	44.556	309	13.02	173
18.8	46.155	360	21.15	156	10.48	66	39.66	105	15.969	447	23.83	131	44.865	308	14.75	169
28.7	46.515	349	22.71	172	11.14	64	40.71	147	16.416	436	25.14	163	45.173	299	16.44	161
Aug. 7.7	46.864	332	24.43	186	11.78	61	42.18	185	16.852	416	26.77	188	45.472	286	18.05	150
17.7	47.196	308	26.29	194	12.39	57	44.03	220	17.268	387	28.65	213	45.758	265	19.55	135
27.7	47.504	281	28.23	199	12.96	53	46.23	249	17.655	355	30.78	230	46.023	241	20.90	115
Sept. 6.6	47.785	250	30.22	199	13.49	47	48.72	278	18.010	316	33.08	243	46.264	214	22.05	95
16.6	48.035	215	32.21	196	13.96	39	51.45	293	18.326	275	35.51	252	46.478	185	23.00	72
26.6	48.250	182	34.17	189	14.35	34	54.38	306	18.601	231	38.03	256	46.663	154	23.72	51
Oct. 6.5	48.432	145	36.06	179	14.69	27	57.44	312	18.832	185	40.59	255	46.817	124	24.23	28
16.5	48.577	110	37.85	166	14.96	19	60.56	313	19.017	138	43.14	248	46.941	94	24.51	9
26.5	48.687	73	39.51	151	15.15	11	63.69	306	19.155	90	45.62	238	47.035	64	24.60	9
Nov. 5.5	48.760	38	41.02	134	15.26	3	66.75	294	19.245	42	48.00	222	47.099	34	24.51	24
15.4	48.798	3	42.36	113	15.29	6	69.69	273	19.287	7	50.22	199	47.133	7	24.27	37
25.4	48.801	32	43.49	92	15.23	13	72.42	243	19.280	54	52.21	173	47.140	22	23.90	47
Dec. 5.4	48.769	66	44.41	66	15.10	21	74.85	209	19.226	102	53.94	144	47.118	48	23.43	54
15.4	48.703	98	45.07	41	14.89	28	76.94	167	19.124	145	55.38	107	47.070	74	22.89	60
25.3	48.605	127	45.48	12	14.61	34	78.61	119	18.979	184	56.45	67	46.996	96	22.29	64
35.3	48.478		45.60		14.27		79.80		18.795		57.12		46.900		21.65	
Mean Place	43.090		17.20		6.296		44.26		12.506		24.91		42.264		2.00	
Sec δ, Tan δ	1.215		+0.690		2.473		+2.262		1.579		+1.222		1.011		+0.149	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.07		−0.04		+0.09		−0.13		+0.08		−0.07		+0.06		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Fornacis. Mag. 5.2				γ Trianguli. Mag. 4.1				67 Ceti. Mag. 5.7				φ Eridani. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 2 9 s		° ′ −31 5 ″		h m 2 12 s		° ′ +33 28 ″		h m 2 12 s		° ′ − 6 47 ″		h m 2 13 s		° ′ −51 52 ″	
Jan. 0.3	21.591	159	80.17	108	31.597	131	36.61	2	58.062	111	41.49	92	38.235	269	84.15	105
10.3	21.432	173	81.25	70	31.466	154	36.59	30	57.951	127	42.41	75	37.966	287	85.20	55
20.3	21.259	182	81.95	30	31.312	171	36.29	56	57.824	139	43.16	59	37.679	297	85.75	2
30.2	21.077	187	82.25	12	31.141	177	35.73	82	57.685	144	43.75	41	37.382	297	85.73	55
Feb. 9.2	20.890	182	82.13	52	30.964	175	34.91	102	57.541	144	44.16	19	37.085	287	85.18	107
19.2	20.708	168	81.61	90	30.789	162	33.89	120	57.397	135	44.35	2	36.798	267	84.11	155
Mar. 1.2	20.540	149	80.71	129	30.627	141	32.69	132	57.262	117	44.33	25	36.531	240	82.56	201
11.1	20.391	119	79.42	163	30.486	108	31.37	137	57.145	93	44.08	48	36.291	200	80.55	239
21.1	20.272	85	77.79	195	30.378	67	30.00	137	57.052	61	43.60	72	36.091	153	78.16	274
31.1	20.187	43	75.84	224	30.311	20	28.63	130	56.991	23	42.88	95	35.938	100	75.42	302
Apr. 10.0	20.144	2	73.60	248	30.291	31	27.33	115	56.968	18	41.93	120	35.838	39	72.40	323
20.0	20.146	51	71.12	266	30.322	86	26.18	98	56.986	63	40.73	142	35.799	23	69.17	337
30.0	20.197	100	68.46	280	30.408	140	25.20	72	57.049	107	39.31	162	35.822	87	65.80	345
May 10.0	20.297	149	65.66	287	30.548	191	24.48	45	57.156	151	37.69	179	35.909	151	62.35	344
19.9	20.446	194	62.79	289	30.739	238	24.03	15	57.307	190	35.90	192	36.060	211	58.91	336
29.9	20.640	233	59.90	282	30.977	278	23.88	17	57.497	227	33.98	202	36.271	266	55.55	320
June 8.9	20.873	270	57.08	270	31.255	311	24.05	46	57.724	257	31.96	207	36.537	315	52.35	294
18.9	21.143	296	54.38	250	31.566	336	24.51	78	57.981	279	29.89	206	36.852	355	49.41	263
28.8	21.439	315	51.88	223	31.902	353	25.29	104	58.260	294	27.83	199	37.207	386	46.78	224
July 8.8	21.754	326	49.65	192	32.255	358	26.33	128	58.554	303	25.84	187	37.593	405	44.54	179
18.8	22.080	329	47.73	152	32.613	357	27.61	150	58.857	302	23.97	169	37.998	414	42.75	129
28.7	22.409	324	46.21	111	32.970	347	29.11	167	59.159	296	22.28	148	38.412	412	41.46	75
Aug. 7.7	22.733	308	45.10	64	33.317	332	30.78	178	59.455	283	20.80	120	38.824	396	40.71	17
17.7	23.041	289	44.46	16	33.649	309	32.56	187	59.738	264	19.60	92	39.220	373	40.54	39
27.7	23.330	261	44.30	31	33.958	284	34.43	190	60.002	241	18.68	59	39.593	339	40.93	97
Sept. 6.6	23.591	230	44.61	77	34.242	254	36.33	190	60.243	213	18.09	27	39.932	297	41.90	149
16.6	23.821	194	45.38	120	34.496	221	38.23	187	60.456	185	17.82	4	40.229	248	43.39	197
26.6	24.015	156	46.58	158	34.717	188	40.10	180	60.641	153	17.86	35	40.477	193	45.36	236
Oct. 6.6	24.171	117	48.16	189	34.905	152	41.90	170	60.794	121	18.21	62	40.670	135	47.72	268
16.5	24.288	78	50.05	212	35.057	117	43.60	157	60.915	92	18.83	84	40.805	78	50.40	290
26.5	24.366	39	52.17	226	35.174	82	45.17	143	61.007	60	19.67	101	40.883	20	53.30	299
Nov. 5.5	24.405	3	54.43	232	35.256	48	46.60	127	61.067	29	20.68	115	40.903	38	56.29	299
15.4	24.408	35	56.75	227	35.304	11	47.87	107	61.096	2	21.83	121	40.865	92	59.28	286
25.4	24.373	67	59.02	213	35.315	23	48.94	87	61.098	27	23.04	123	40.773	141	62.14	261
Dec. 5.4	24.306	97	61.15	194	35.292	57	49.81	63	61.071	53	24.27	119	40.632	185	64.75	227
15.4	24.209	124	63.09	166	35.235	89	50.44	40	61.018	79	25.46	112	40.447	224	67.02	188
25.3	24.085	148	64.75	133	35.146	120	50.84	13	60.939	102	26.58	102	40.223	254	68.90	140
35.3	23.937		66.08		35.026		50.97		60.837		27.60		39.969		70.30	
Mean Place	20.182		73.21		29.609		23.70		56.515		41.72		36.838		72.46	
Sec δ, Tan δ	1.168		−0.603		1.199		+0.661		1.007		−0.119		1.620		−1.275	
$D_\psi\alpha$, $D_\omega\alpha$	+0.05		+0.03		+0.07		−0.04		+0.06		+0.01		+0.04		+0.07	
$D_\psi\delta$, $D_\omega\delta$	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.6	

Washington Mean Time.	**o Ceti. (*Mira.*) Var. 1.7–9.6**				**κ Fornacis. Mag. 5.4**				**δ Hydri. Mag. 4.3**				**ι Cassiopeiæ. Mag. 4.6**			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 2 15 s		° ′ − 3 20 ″		h m 2 18 s		° ′ −24 10 ″		h m 2 20 s		° ′ −69 1 ″		h m 2 22 s		° ′ +67 2 ″	
Jan. 0.3	16.791	107	39.68	88	51.621	135	67.64	114	19.70	55	53.64	95	25.97	36	40.88	107
10.3	16.684	126	40.56	75	51.486	153	68.78	80	19.15	58	54.59	35 —	25.61	43	41.95	54 —
20.3	16.558	137	41.31	63	51.333	166	69.58	47	18.57	59	54.94	25	25.18	45	42.49	1
30.2	16.421	143	41.94	46	51.167	170	70.05	11 —	17.98	58	54.69	84	24.73	47	42.48	55
Feb. 9.2	16.278	142	42.40	28	50.997	169	70.16	26	17.40	57	53.85	140	24.26	45	41.93	108
19.2	16.136	134	42.68	11 —	50.828	158	69.90	61	16.83	52	52.45	191	23.81	41	40.85	155
Mar. 1.2	16.002	117	42.79	9	50.670	142	69.29	95	16.31	47	50.54	237	23.40	37	39.30	195
11.1	15.885	93	42.70	31	50.528	116	68.34	128	15.84	40	48.17	277	23.03	30	37.35	227
21.1	15.792	62	42.39	52	50.412	83	67.06	158	15.44	34	45.40	310	22.73	21	35.08	252
31.1	15.730	24 —	41.87	76	50.329	45	65.48	186	15.10	24	42.30	336	22.52	11	32.56	263
Apr. 10.0	15.706	18	41.11	99	50.284	1 —	63.62	212	14.86	15	38.94	356	22.41	0	29.93	265
20.0	15.724	62	40.12	121	50.283	46	61.50	231	14.71	3 —	35.38	365	22.41	12	27.28	256
30.0	15.786	106	38.91	141	50.329	93	59.19	249	14.68	6	31.73	368	22.53	21	24.72	240
May 10.0	15.892	150	37.50	161	50.422	139	56.70	260	14.74	16	28.05	362	22.74	32	22.32	214
19.9	16.042	190	35.89	175	50.561	183	54.10	266	14.90	26	24.43	348	23.06	41	20.18	180
29.9	16.232	227	34.14	187	50.744	222	51.44	264	15.16	36	20.95	327	23.47	50	18.38	143
June 8.9	16.459	256	32.27	194	50.966	257	48.80	257	15.52	44	17.68	295	23.97	58	16.95	99
18.9	16.715	278	30.33	196	51.223	282	46.23	244	15.96	52	14.73	257	24.55	61	15.96	54
28.8	16.993	294	28.37	193	51.505	303	43.79	222	16.48	57	12.16	213	25.16	65	15.42	8 —
July 8.8	17.287	302	26.44	184	51.808	312	41.57	197	17.05	61	10.03	163	25.81	68	15.34	38
18.8	17.589	303	24.60	168	52.120	317	39.60	163	17.66	63	8.40	107	26.49	68	15.72	83
28.7	17.892	296	22.92	151	52.437	311	37.97	127	18.29	65	7.33	47 —	27.17	67	16.55	127
Aug. 7.7	18.188	283	21.41	128	52.748	299	36.70	86	18.94	63	6.86	11	27.84	64	17.82	166
17.7	18.471	264	20.13	102	53.047	281	35.84	42 —	19.57	59	6.97	73	28.48	61	19.48	202
27.7	18.735	242	19.11	72	53.328	256	35.42	2	20.16	55	7.70	132	29.09	57	21.50	233
Sept. 6.6	18.977	214	18.39	42	53.584	228	35.44	45	20.71	47	9.02	186	29.66	51	23.83	260
16.6	19.191	186	17.97	12 —	53.812	196	35.89	86	21.18	40	10.88	235	30.17	45	26.43	280
26.6	19.377	155	17.85	17	54.008	161	36.75	125	21.58	30	13.23	275	30.62	38	29.23	297
Oct. 6.6	19.532	125	18.02	42	54.169	126	38.00	156	21.88	20	15.98	305	31.00	32	32.20	308
16.5	19.657	95	18.44	65	54.295	92	39.56	179	22.08	10 —	19.03	323	31.32	23	35.28	310
26.5	19.752	64	19.09	83	54.387	55	41.35	197	22.18	1	22.26	329	31.55	14	38.38	307
Nov. 5.5	19.816	34	19.92	95	54.442	20 —	43.32	205	22.17	13	25.55	324	31.69	6 —	41.45	297
15.4	19.850	6 —	20.87	104	54.462	13	45.37	205	22.04	23	28.79	304	31.75	1	44.42	280
25.4	19.856	23	21.91	108	54.449	44	47.42	198	21.81	31	31.83	275	31.74	10	47.22	254
Dec. 5.4	19.833	49	22.99	107	54.405	74	49.40	182	21.50	40	34.58	235	31.64	19	49.76	222
15.4	19.784	75	24.06	103	54.331	100	51.22	160	21.10	48	36.93	185	31.45	27	51.98	182
25.3	19.709	97	25.09	94	54.231	126	52.82	134	20.62	52	38.78	133	31.18	33	53.80	137
35.3	19.612		26.03		54.105		54.16		20.10		40.11		30.85		55.17	
Mean Place	15.209		40.97		50.135		62.49		18.136		39.63		22.323		21.13	
Sec δ, Tan δ	1.002		−0.058		1.096		−0.449		2.794		−2.608		2.564		+2.361	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		0.00		+0.05		+0.02		+0.02		+0.14		+0.10		−0.13	
$D_\psi\delta$, $D_\omega\delta$	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ² Ceti. Mag. 4.3				σ Ceti. Mag. 4.8				36 H. Cassiopeiæ. Mag. 5.3				ν Ceti. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 2 23 s		° ′ + 8 5 ″		h m 2 28 s		° ′ −15 35 ″		h m 2 30 s		° ′ +72 27 ″		h m 2 31 s		° + 5 14 ″	
Jan. 0.3	52.713		56.32		16.374		60.47		22.55		74.46		38.995		29.47	
10.3	52.612	101	55.67	65	16.256	118	61.58	111	22.05	50	75.76	130	38.897	98	28.75	72
20.3	52.490	122	55.02	65	16.121	135	62.44	86	21.49	56	76.54	78	38.777	120	28.07	68
30.2	52.355	135	54.38	64	15.971	150	63.03	59	20.89	60	76.74	20	38.642	135	27.43	64
Feb. 9.2	52.210	145	53.78	60	15.813	158	63.34	31	20.27	62	76.36	38	38.497	145	26.86	57
19.2	52.065	145	53.23	55	15.655	158	63.37	3	19.65	62	75.40	96	38.350	147	26.38	48
Mar. 1.2	51.927	138	52.76	47	15.503	152	63.10	27	19.08	57	73.94	146	38.208	142	26.00	38
11.1	51.805	122	52.39	37	15.366	137	62.53	57	18.57	51	72.03	191	38.082	126	25.75	25
21.1	51.707	98	52.16	23	15.254	112	61.68	85	18.15	42	69.73	230	37.978	104	25.64	11
31.1	51.641	66	52.07	9	15.172	82	60.55	113	17.84	31	67.16	257	37.905	73	25.70	6
Apr. 10.1	51.613	28	52.17	10	15.126	46	59.16	139	17.67	17	64.42	274	37.869	36	25.96	26
20.0	51.628	15	52.48	31	15.122	4	57.51	165	17.63	4	61.62	280	37.875	6	26.42	46
30.0	51.687	59	52.99	51	15.164	42	55.65	186	17.73	10	58.86	276	37.925	50	27.10	68
May 10.0	51.793	106	53.74	75	15.252	88	53.58	207	17.97	24	56.25	261	38.021	96	27.98	88
19.9	51.943	150	54.70	96	15.383	131	51.38	220	18.34	37	53.86	239	38.161	140	29.08	110
29.9	52.135	192	55.86	116	15.557	174	49.08	230	18.84	50	51.80	206	38.343	182	30.37	129
June 8.9	52.362	227	57.20	134	15.770	213	46.73	235	19.43	59	50.10	170	38.562	219	31.82	145
18.9	52.621	259	58.69	149	16.016	246	44.39	234	20.13	70	48.83	127	38.813	251	33.40	158
28.8	52.903	282	60.30	161	16.287	271	42.11	228	20.89	76	48.01	82	39.088	275	35.08	168
July 8.8	53.200	297	61.96	166	16.577	290	39.97	214	21.71	82	47.67	34	39.381	293	36.79	171
18.8	53.508	308	63.65	169	16.878	301	38.02	195	22.55	84	47.80	13	39.683	302	38.50	171
28.8	53.816	308	65.29	164	17.184	306	36.32	170	23.41	86	48.41	61	39.988	305	40.14	164
Aug. 7.7	54.117	301	66.87	158	17.485	301	34.91	141	24.26	85	49.48	107	40.289	301	41.68	154
17.7	54.407	290	68.33	146	17.775	290	33.84	107	25.09	83	50.98	150	40.579	290	43.08	140
27.7	54.679	272	69.62	129	18.050	275	33.15	69	25.88	79	52.87	189	40.853	274	44.29	121
Sept. 6.6	54.929	250	70.72	110	18.302	252	32.84	31	26.61	73	55.12	225	41.105	252	45.29	100
16.6	55.155	226	71.62	90	18.529	227	32.92	8	27.28	67	57.69	257	41.334	229	46.04	75
26.6	55.352	197	72.28	66	18.726	197	33.38	46	27.87	59	60.50	281	41.535	201	46.57	53
Oct. 6.6	55.521	169	72.74	46	18.893	167	34.18	80	28.37	50	63.53	303	41.709	174	46.84	27
16.5	55.661	140	72.96	22	19.028	135	35.30	112	28.79	42	66.69	316	41.854	145	46.90	6
26.5	55.769	108	73.00	4	19.130	102	36.66	136	29.11	32	69.93	324	41.969	115	46.73	17
Nov. 5.5	55.848	79	72.86	14	19.200	70	38.20	154	29.30	19	73.18	325	42.055	86	46.40	33
15.5	55.899	51	72.56	30	19.238	38	39.87	167	29.40	10	76.36	318	42.110	55	45.92	48
25.4	55.919	20	72.16	40	19.245	7	41.57	170	29.38	2	79.38	302	42.135	25	45.33	59
Dec. 5.4	55.910	9	71.65	51	19.220	25	43.26	169	29.25	13	82.18	280	42.133	2	44.65	68
15.4	55.873	37	71.08	57	19.167	53	44.84	158	28.99	26	84.66	248	42.100	33	43.92	73
25.3	55.807	66	70.46	62	19.087	80	46.29	145	28.63	36	86.76	210	42.039	61	43.19	73
35.3	55.718	89	69.81	65	18.982	105	47.54	125	28.18	45	88.38	162	41.954	85	42.45	74
Mean Place	50.991		51.63		14.799		57.66		17.917		54.51		37.258		25.96	
Sec δ, Tan δ	1.010		+0.142		1.038		−0.279		3.320		+3.166		1.004		+0.092	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		−0.01		+0.06		+0.01		+0.11		−0.17		+0.06		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6	

Washington Mean Time.	ν Piscium. Mag. 4.7				φ Persei. Mag. 4.2				τ Ceti. Mag. 3.6				ο Piscium. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 1 37 s		° ′ + 5 4 ″		h m 1 38 s		° ′ +50 16 ″		h m 1 40 s		° ′ −16 21 ″		h m 1 41 s		° ′ + 8 45 ″	
Jan. 0.3	14.288	113	46.62	71	36.539	217	71.46	14	19.563	132	51.10	80	8.331	114	8.09	66
10.3	14.175	124	45.91	68	36.322	235	71.60	— 31	19.431	142	51.90	57	8.217	125	7.43	70
20.2	14.051	131	45.23	65	36.087	244	71.29	75	19.289	146	52.47	29	8.092	132	6.73	68
30.2	13.920	130	44.58	60	35.843	241	70.54	115	19.143	146	52.76	2	7.960	133	6.05	67
Feb. 9.2	13.790	123	43.98	51	35.602	227	69.39	151	18.997	137	52.78	— 27	7.827	127	5.38	62
19.2	13.667	109	43.47	40	35.375	199	67.88	180	18.860	121	52.51	54	7.700	112	4.76	54
Mar. 1.1	13.558	88	43.07	25	35.176	160	66.08	202	18.739	101	51.97	84	7.588	91	4.22	43
11.1	13.470	58	42.82	10	35.016	110	64.06	216	18.638	71	51.13	110	7.497	62	3.79	28
21.1	13.412	24	42.72	— 11	34.906	51	61.90	220	18.567	36	50.03	137	7.435	27	3.51	11
31.0	13.388	— 16	42.83	32	34.855	— 13	59.70	212	18.531	— 4	48.66	162	7.408	— 14	3.40	— 9
Apr. 10.0	13.404	59	43.15	55	34.868	81	57.58	200	18.535	45	47.04	184	7.422	57	3.49	33
20.0	13.463	103	43.70	80	34.949	151	55.58	176	18.580	91	45.20	204	7.479	102	3.82	57
30.0	13.566	147	44.50	101	35.100	215	53.82	147	18.671	136	43.16	219	7.581	146	4.39	82
May 9.9	13.713	187	45.51	127	35.315	276	52.35	112	18.807	177	40.97	231	7.727	188	5.21	104
19.9	13.900	226	46.78	144	35.591	331	51.23	73	18.984	216	38.66	238	7.915	225	6.25	127
29.9	14.126	257	48.22	163	35.922	373	50.50	32	19.200	249	36.28	238	8.140	258	7.52	146
June 8.9	14.383	281	49.85	175	36.295	408	50.18	— 12	19.449	274	33.90	234	8.398	283	8.98	163
18.8	14.664	298	51.60	182	36.703	431	50.30	53	19.723	294	31.56	224	8.681	300	10.61	173
28.8	14.962	309	53.42	186	37.134	442	50.83	93	20.017	306	29.32	206	8.981	310	12.34	179
July 8.8	15.271	310	55.28	185	37.576	444	51.76	131	20.323	309	27.26	184	9.291	312	14.13	182
18.7	15.581	302	57.13	178	38.020	434	53.07	166	20.632	302	25.42	156	9.603	305	15.95	179
28.7	15.883	290	58.91	165	38.454	416	54.73	195	20.934	291	23.86	125	9.908	293	17.74	170
Aug. 7.7	16.173	271	60.56	150	38.870	388	56.68	222	21.225	273	22.61	91	10.201	275	19.44	158
17.7	16.444	245	62.06	131	39.258	356	58.90	241	21.498	246	21.70	53	10.476	250	21.02	142
27.6	16.689	218	63.37	108	39.614	316	61.31	258	21.744	218	21.17	16	10.726	222	22.44	122
Sept. 6.6	16.907	188	64.45	85	39.930	274	63.89	267	21.962	186	21.01	— 22	10.948	194	23.66	103
16.6	17.095	154	65.30	60	40.204	229	66.56	271	22.148	150	21.23	54	11.142	160	24.69	79
26.6	17.249	123	65.90	37	40.433	183	69.27	270	22.298	116	21.77	86	11.302	128	25.48	58
Oct. 6.5	17.372	91	66.27	14	40.616	135	71.97	266	22.414	80	22.63	113	11.430	98	26.06	37
16.5	17.463	60	66.41	— 6	40.751	87	74.63	253	22.494	47	23.76	132	11.528	65	26.43	15
26.5	17.523	30	66.35	24	40.838	40	77.16	238	22.541	14	25.08	146	11.593	37	26.58	— 2
Nov. 5.4	17.553	3	66.11	39	40.878	— 7	79.54	216	22.555	— 16	26.54	152	11.630	8	26.56	18
15.4	17.556	— 24	65.72	51	40.871	51	81.70	190	22.539	43	28.06	153	11.638	— 19	26.38	32
25.4	17.532	47	65.21	60	40.820	94	83.60	158	22.496	69	29.59	147	11.619	43	26.06	42
Dec. 5.4	17.485	70	64.61	66	40.726	137	85.18	123	22.427	90	31.06	134	11.576	68	25.64	52
15.3	17.415	90	63.95	71	40.589	173	86.41	83	22.337	112	32.40	117	11.508	88	25.12	60
25.3	17.325	107	63.24	71	40.416	204	87.24	40	22.225	126	33.57	98	11.420	106	24.52	64
35.3	17.218		62.53		40.212		87.64		22.099		34.55		11.314		23.88	
Mean Place	12.857		41.50		34.455		52.51		18.268		48.80		6.847		1.80	
Sec δ, Tan δ	1.004		+0.089		1.565		+1.204		1.042		−0.294		1.012		+0.154	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		−0.01		+0.07		−0.07		+0.06		+0.02		+0.06		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**θ Persei.** Mag. 4.2				**γ Ceti *seq.*** Mag. 3.7				**π Ceti.** Mag. 4.4				**μ Ceti.** Mag. 4.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 38		+48 53		2 39		+ 2 53		2 40		−14 11		2 40		+ 9 46	
	s		″		s		″		s		″		s		″	
Jan. 0.3	42.148		27.79		7.844		45.01		17.620		66.47		35.462		27.29	
10.3	41.978	170	28.43	64	7.748	96	44.23	78	17.509	111	67.61	114	35.368	94	26.69	60
20.3	41.773	205	28.69 —	26	7.629	119	43.51	72	17.377	132	68.53	92	35.250	118	26.07	62
30.3	41.542	231	28.54	15	7.494	135	42.86	65	17.229	148	69.18	65	35.115	135	25.46	61
Feb. 9.2	41.297	245	27.99	55	7.348	146	42.31	55	17.070	159	69.58	40	34.968	147	24.87	59
19.2	41.049	248	27.08	91	7.199	149	41.86	45	16.909	161	69.69 —	11	34.817	151	24.31	56
Mar. 1.2	40.812	237	25.82	126	7.053	146	41.54	32	16.753	156	69.51	18	34.671	146	23.81	50
11.1	40.599	213	24.28	154	6.921	132	41.38	16	16.610	143	69.05	46	34.538	133	23.39	42
21.1	40.426	173	22.53	175	6.812	109	41.36 —	2	16.489	121	68.30	75	34.428	110	23.09	30
31.1	40.300	126	20.64	189	6.732	80	41.54	18	16.397	92	67.28	102	34.349	79	22.93	16
Apr. 10.1	40.231	69	18.69	195	6.687	45	41.91	37	16.342	55	65.99	129	34.306	43	22.92 —	1
20.0	40.228 —	3	16.77	192	6.684 —	3	42.49	58	16.328 —	14	64.45	154	34.304 —	2	23.11	19
30.0	40.292	64	14.95	182	6.726	42	43.29	80	16.358	30	62.69	176	34.349	45	23.49	38
May 10.0	40.424	132	13.31	164	6.812	86	44.29	100	16.434	76	60.73	196	34.440	91	24.10	61
20.0	40.621	197	11.90	141	6.944	132	45.51	122	16.555	121	58.60	213	34.577	137	24.91	81
29.9	40.878	257	10.80	110	7.119	175	46.90	139	16.720	165	56.37	223	34.757	180	25.92	101
June 8.9	41.189	311	10.02	78	7.331	212	48.43	153	16.923	203	54.07	230	34.974	217	27.13	121
18.9	41.546	357	9.58	44	7.575	244	50.09	166	17.159	236	51.77	230	35.224	250	28.48	135
28.8	41.937	391	9.52 —	6	7.845	270	51.81	172	17.424	265	49.51	226	35.499	275	29.96	148
July 8.8	42.353	416	9.82	30	8.133	288	53.56	175	17.708	284	47.38	213	35.793	294	31.52	156
18.8	42.785	432	10.47	65	8.432	299	55.29	173	18.005	297	45.41	197	36.099	306	33.11	159
28.8	43.222	437	11.44	97	8.735	303	56.92	163	18.308	303	43.68	173	36.407	308	34.69	158
Aug. 7.7	43.654	432	12.73	129	9.034	299	58.45	153	18.609	301	42.23	145	36.712	305	36.22	153
17.7	44.074	420	14.28	155	9.325	291	59.80	135	18.902	293	41.11	112	37.008	296	37.64	142
27.7	44.474	400	16.06	178	9.600	275	60.94	114	19.180	278	40.35	76	37.289	281	38.92	128
Sept. 6.7	44.847	373	18.02	196	9.855	255	61.85	91	19.437	257	39.97	38	37.550	261	40.02	110
16.6	45.189	342	20.14	212	10.087	232	62.50	65	19.671	234	39.96 —	1	37.789	239	40.94	92
26.6	45.495	306	22.36	222	10.293	206	62.90	40	19.878	207	40.34	38	38.001	212	41.63	69
Oct. 6.6	45.762	267	24.64	228	10.472	179	63.03 —	13	20.056	178	41.07	73	38.187	186	42.13	50
16.5	45.989	227	26.95	231	10.623	151	62.93	10	20.203	147	42.10	103	38.343	156	42.41	28
26.5	46.172	183	29.24	229	10.743	120	62.61	32	20.318	115	43.40	130	38.471	128	42.50 —	9
Nov. 5.5	46.309	137	31.46	222	10.834	91	62.12	49	20.401	83	44.88	148	38.569	98	42.44	6
15.5	46.400	91	33.56	210	10.895	61	61.47	65	20.453	52	46.51	163	38.637	68	42.21	23
25.4	46.442 —	42	35.52	196	10.926	31	60.72	75	20.472 —	19	48.19	168	38.674	37	41.87	34
Dec. 5.4	46.435	7	37.27	175	10.927 —	1	59.90	82	20.460	12	49.85	166	38.682 —	8	41.43	44
15.4	46.378	57	38.77	150	10.901	26	59.05	85	20.418	42	51.44	159	38.658	24	40.92	51
25.4	46.273	105	39.97	120	10.844	57	58.21	84	20.347	71	52.90	146	38.605	53	40.36	56
35.3	46.123	150	40.83	86	10.760	84	57.39	82	20.249	98	54.19	129	38.523	82	39.77	59
Mean Place	39.530		12.45		6.089		42.48		15.976		63.85		33.633		22.69	
Sec δ, Tan δ	1.521		+1.146		1.001		+0.051		1.032		−0.253		1.015		+0.172	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.08		−0.06		+0.06		0.00		+0.06		+0.01		+0.06		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**η Persei.** Mag. 3.9 Right Ascension.	Δ	**η Persei.** Declination.	Δ	**41 Arietis.** Mag. 3.7 Right Ascension.	Δ	**41 Arietis.** Declination.	Δ	**β Fornacis.** Mag. 4.5 Right Ascension.	Δ	**β Fornacis.** Declination.	Δ	**σ Arietis.** Mag. 5.5 Right Ascension.	Δ	**σ Arietis.** Declination.	Δ
	h m 2 44		° ′ +55 33		h m 2 45		° ′ +26 55		h m 2 45		° ′ −32 44		h m 2 47		° ′ +14 44	
	s		″		s		″		s		″		s		″	
Jan. 0.3	49.659	206	53.53	93	14.770	104	48.48	6	43.647	153	51.80	143	2.963	92	61.97	45
10.3	49.453	249	54.46	49	14.666	131	48.42	26	43.494	175	53.23	102	2.871	118	61.52	51
20.3	49.204	279	54.95	5	14.535	152	48.16	42	43.319	191	54.25	61	2.753	137	61.01	56
30.3	48.925	297	55.00	41	14.383	168	47.74	60	43.128	202	54.86	17	2.616	150	60.45	59
Feb. 9.2	48.628	301	54.59	85	14.215	171	47.14	76	42.926	205	55.03	27	2.466	156	59.86	61
19.2	48.327	289	53.74	125	14.044	165	46.38	87	42.721	198	54.76	68	2.310	152	59.25	60
Mar. 1.2	48.038	261	52.49	160	13.879	152	45.51	96	42.523	183	54.08	109	2.158	139	58.65	57
11.1	47.777	218	50.89	186	13.727	126	44.55	99	42.340	158	52.99	148	2.019	117	58.08	51
21.1	47.559	162	49.03	208	13.601	92	43.56	98	42.182	126	51.51	182	1.902	86	57.57	41
31.1	47.397	95	46.95	218	13.509	51	42.58	92	42.056	87	49.69	214	1.816	50	57.16	27
Apr. 10.1	47.302	23	44.77	220	13.458	3	41.66	80	41.969	41	47.55	241	1.766	6	56.89	11
20.0	47.279	55	42.57	212	13.455	48	40.86	63	41.928	6	45.14	265	1.760	40	56.78	8
30.0	47.334	134	40.45	198	13.503	98	40.23	45	41.934	57	42.49	280	1.800	87	56.86	29
May 10.0	47.468	209	38.47	176	13.601	148	39.78	20	41.991	107	39.69	292	1.887	134	57.15	50
20.0	47.677	278	36.71	148	13.749	196	39.58	3	42.098	156	36.77	297	2.021	178	57.65	72
29.9	47.955	343	35.23	113	13.945	236	39.61	29	42.254	201	33.80	294	2.199	218	58.37	91
June 8.9	48.298	395	34.10	78	14.181	274	39.90	54	42.455	241	30.86	284	2.417	251	59.28	111
18.9	48.693	437	33.32	38	14.455	301	40.44	78	42.696	273	28.02	266	2.668	277	60.39	126
28.8	49.130	469	32.94	1	14.756	321	41.22	98	42.969	299	25.36	243	2.945	297	61.65	137
July 8.8	49.599	488	32.93	40	15.077	333	42.20	118	43.268	317	22.93	212	3.242	310	63.02	146
18.8	50.087	495	33.33	77	15.410	338	43.38	131	43.585	327	20.81	174	3.552	314	64.48	149
28.8	50.582	491	34.10	113	15.748	334	44.69	142	43.912	328	19.07	131	3.866	311	65.97	148
Aug. 7.7	51.073	480	35.23	144	16.082	325	46.11	149	44.240	321	17.76	85	4.177	302	67.45	144
17.7	51.553	459	36.67	173	16.407	309	47.60	153	44.561	306	16.91	35	4.479	288	68.89	134
27.7	52.012	431	38.40	198	16.716	290	49.13	151	44.867	287	16.56	15	4.767	270	70.23	121
Sept. 6.7	52.443	396	40.38	219	17.006	265	50.64	147	45.154	260	16.71	65	5.037	246	71.44	107
16.6	52.839	357	42.57	234	17.271	239	52.11	141	45.414	229	17.36	112	5.283	221	72.51	90
26.6	53.196	313	44.91	246	17.510	210	53.52	132	45.643	195	18.48	155	5.504	195	73.41	72
Oct. 6.6	53.509	267	47.37	254	17.720	181	54.84	120	45.838	157	20.03	191	5.699	167	74.13	55
16.5	53.776	216	49.91	255	17.901	148	56.04	109	45.995	119	21.94	221	5.866	137	74.68	37
26.5	53.992	162	52.46	253	18.049	116	57.13	97	46.114	81	24.15	239	6.003	107	75.05	20
Nov. 5.5	54.154	107	54.99	244	18.165	83	58.10	83	46.195	40	26.54	250	6.110	77	75.25	8
15.5	54.261	48	57.43	231	18.248	50	58.93	68	46.235	2	29.04	251	6.187	47	75.33	6
25.4	54.309	11	59.74	209	18.298	13	59.61	54	46.237	37	31.55	242	6.234	14	75.27	16
Dec. 5.4	54.298	69	61.83	185	18.311	21	60.15	39	46.200	73	33.97	224	6.248	18	75.11	26
15.4	54.229	127	63.68	153	18.290	57	60.54	21	46.127	107	36.21	197	6.230	48	74.85	34
25.4	54.102	182	65.21	117	18.233	88	60.75	4	46.020	136	38.18	164	6.182	79	74.51	42
35.3	53.920		66.38		18.145		60.79		45.884		39.82		6.103		74.09	
Mean Place	46.664		37.25		12.683		39.06		42.041		44.18		1.045		56.15	
Sec δ, Tan δ	1.768		+1.458		1.122		+0.508		1.189		−0.643		1.034		+0.263	
$D_\psi\alpha$, $D_\omega\alpha$	+0.09		−0.07		+0.07		−0.03		+0.05		+0.03		+0.07		−0.01	
$D_\psi\delta$, $D_\omega\delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ² Eridani. Mag. 4.8				τ Persei. Mag. 4.1				η Eridani. Mag. 4.0				ε Arietis (*mean*). Mag. 4.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 47		−21 19		2 48		+52 25		2 52		− 9 12		2 54		+21 1	
	s		″		s		″		s		″		s		″	
Jan. 0.3	23.420	121	78.50	130	33.151	182	70.60	84	29.922	98	72.69	111	36.631	92	8.96	24
10.3	23.299	144	79.80	101	32.969	222	71.44	46	29.824	124	73.80	93	36.539	121	8.72	35
20.3	23.155	161	80.81	69	32.747	254	71.90	2	29.700	141	74.73	71	36.418	142	8.37	46
30.3	22.994	172	81.50	34	32.493	271	71.92	41	29.559	154	75.44	50	36.276	157	7.91	56
Feb. 9.2	22.822	175	81.84	0	32.222	276	71.51	81	29.405	159	75.94	25	36.119	163	7.35	65
19.2	22.647	171	81.84	35	31.946	266	70.70	120	29.246	157	76.19	2	35.956	162	6.70	71
Mar. 1.2	22.476	157	81.49	68	31.680	243	69.50	151	29.089	146	76.21	23	35.794	149	5.99	74
11.2	22.319	137	80.81	101	31.437	203	67.99	177	28.943	124	75.98	49	35.645	126	5.25	74
21.1	22.182	106	79.80	132	31.234	152	66.22	195	28.819	98	75.49	74	35.519	97	4.51	68
31.1	22.076	70	78.48	162	31.082	90	64.27	205	28.721	62	74.75	98	35.422	57	3.83	59
Apr. 10.1	22.006	29	76.86	188	30.992	24	62.22	206	28.659	22	73.77	124	35.365	13	3.24	48
20.0	21.977	17	74.98	211	30.968	50	60.16	199	28.637	22	72.53	145	35.352	35	2.76	29
30.0	21.994	64	72.87	230	31.018	122	58.17	184	28.659	67	71.08	167	35.387	84	2.47	11
May 10.0	22.058	111	70.57	244	31.140	194	56.33	162	28.726	113	69.41	183	35.471	133	2.36	10
20.0	22.169	155	68.13	255	31.334	258	54.71	135	28.839	155	67.58	198	35.604	178	2.46	34
29.9	22.324	197	65.58	257	31.592	318	53.36	102	28.994	195	65.60	207	35.782	220	2.80	55
June 8.9	22.521	231	63.01	253	31.910	368	52.34	67	29.189	229	63.53	212	36.002	255	3.35	78
18.9	22.752	263	60.48	244	32.278	408	51.67	30	29.418	257	61.41	209	36.257	282	4.13	95
28.9	23.015	284	58.04	228	32.686	437	51.37	7	29.675	278	59.32	204	36.539	305	5.08	114
July 8.8	23.299	299	55.76	205	33.123	456	51.44	43	29.953	292	57.28	191	36.844	317	6.22	126
18.8	23.598	308	53.71	176	33.579	464	51.87	79	30.245	298	55.37	171	37.161	324	7.48	135
28.8	23.906	308	51.95	142	34.043	462	52.66	112	30.543	299	53.66	149	37.485	322	8.83	140
Aug. 7.7	24.214	299	50.53	104	34.505	450	53.78	141	30.842	292	52.17	120	37.807	314	10.23	142
17.7	24.513	287	49.49	62	34.955	433	55.19	168	31.134	280	50.97	90	38.121	299	11.65	139
27.7	24.800	267	48.87	19	35.388	406	56.87	190	31.414	261	50.07	54	38.420	283	13.04	133
Sept. 6.7	25.067	244	48.68	25	35.794	376	58.77	210	31.675	241	49.53	20	38.703	260	14.37	124
16.6	25.311	216	48.93	67	36.170	339	60.87	223	31.916	214	49.33	16	38.963	236	15.61	112
26.6	25.527	187	49.60	106	36.509	299	63.10	233	32.130	188	49.49	48	39.199	209	16.73	99
Oct. 6.6	25.714	154	50.66	139	36.808	256	65.43	239	32.318	158	49.97	79	39.408	181	17.72	86
16.6	25.868	120	52.05	168	37.064	210	67.82	240	32.476	129	50.76	103	39.589	151	18.58	71
26.5	25.988	88	53.73	187	37.274	161	70.22	237	32.605	99	51.79	125	39.740	120	19.29	58
Nov. 5.5	26.076	53	55.60	201	37.435	109	72.59	228	32.704	67	53.04	138	39.860	90	19.87	44
15.5	26.129	18	57.61	204	37.544	56	74.87	214	32.771	36	54.42	147	39.950	56	20.31	32
25.4	26.147	15	59.65	201	37.600	1	77.01	196	32.807	5	55.89	148	40.006	24	20.63	19
Dec. 5.4	26.132	47	61.66	190	37.601	54	78.97	172	32.812	27	57.37	144	40.030	12	20.82	8
15.4	26.085	79	63.56	170	37.547	108	80.69	142	32.785	57	58.81	136	40.018	46	20.90	4
25.4	26.006	108	65.26	149	37.439	157	82.11	107	32.728	86	60.17	121	39.972	76	20.86	16
35.3	25.898		66.75		37.282		83.18		32.642		61.38		39.896		20.70	
Mean Place	21.773		73.77		30.287		55.17		28.190		71.26		34.587		1.67	
Sec δ, Tan δ	1.074		−0.391		1.640		+1.300		1.013		−0.162		1.071		+0.384	
$D_\psi a$, $D_\omega a$	+0.05		+0.02		+0.08		−0.06		+0.06		+0.01		+0.07		−0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Eridani. Mag. 3.4				47 H. Cephei. Mag. 5.7				α Ceti. Mag. 2.8				τ^3 Eridani. Mag. 4.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 2 55		° ′ −40 37		h m 2 55		° ′ +79 5		h m 2 58		° ′ + 3 46		h m 2 58		° ′ −23 56	
	s		″		s		″		s		″		s		″	
Jan. 0.3	13.174	180	52.75	156	22.95	77	80.18	179	4.450	88	23.92	79	50.929	122	33.88	143
10.3	12.994	208	54.31	112	22.18	91	81.97	125	4.362	114	23.13	72	50.807	146	35.31	110
20.3	12.786	226	55.43	64	21.27	99	83.22	66	4.248	133	22.41	65	50.661	167	36.41	76
30.3	12.560	238	56.07	16	20.28	104	83.88	4	4.115	147	21.76	57	50.494	179	37.17	39
Feb. 9.2	12.322	240	56.23	— 33	19.24	104	83.92	— 55	3.968	155	21.19	46	50.315	184	37.56	4
19.2	12.082	235	55.90	80	18.20	100	83.37	113	3.813	154	20.73	34	50.131	182	37.60	— 35
Mar. 1.2	11.847	219	55.10	126	17.20	91	82.24	166	3.659	142	20.39	20	49.949	169	37.25	71
11.2	11.628	194	53.84	167	16.29	77	80.58	212	3.517	123	20.19	6	49.780	150	36.54	106
21.1	11.434	160	52.17	205	15.52	62	78.46	248	3.394	95	20.13	— 11	49.630	121	35.48	136
31.1	11.274	118	50.12	238	14.90	42	75.98	274	3.299	60	20.24	31	49.509	85	34.12	169
Apr. 10.1	11.156	70	47.74	268	14.48	22	73.24	290	3.239	20	20.55	50	49.424	44	32.43	196
20.0	11.086	18	45.06	290	14.26	0	70.34	294	3.219	— 25	21.05	72	49.380	— 2	30.47	219
30.0	11.068	— 37	42.16	307	14.26	22	67.40	288	3.244	70	21.77	91	49.382	49	28.28	240
May 10.0	11.105	92	39.09	317	14.48	43	64.52	272	3.314	115	22.68	112	49.431	97	25.88	254
20.0	11.197	145	35.92	320	14.91	65	61.80	247	3.429	158	23.80	129	49.528	143	23.34	262
29.9	11.342	195	32.72	315	15.56	81	59.33	215	3.587	199	25.09	144	49.671	185	20.72	266
June 8.9	11.537	240	29.57	301	16.37	97	57.18	177	3.786	231	26.53	156	49.856	223	18.06	262
18.9	11.777	278	26.56	282	17.34	111	55.41	133	4.017	260	28.09	165	50.079	256	15.44	252
28.9	12.055	310	23.74	253	18.45	120	54.08	88	4.277	279	29.74	168	50.335	279	12.92	235
July 8.8	12.365	331	21.21	218	19.65	127	53.20	38	4.556	294	31.42	165	50.614	298	10.57	210
18.8	12.696	345	19.03	176	20.92	132	52.82	— 10	4.850	301	33.07	159	50.912	308	8.47	182
28.8	13.041	351	17.27	130	22.24	133	52.92	58	5.151	300	34.66	149	51.220	309	6.65	145
Aug. 7.7	13.392	347	15.97	78	23.57	131	53.50	105	5.451	294	36.15	132	51.529	304	5.20	104
17.7	13.739	334	15.19	25	24.88	128	54.55	150	5.745	283	37.47	113	51.833	294	4.16	62
27.7	14.073	313	14.94	— 31	26.16	122	56.05	190	6.028	264	38.60	90	52.127	276	3.54	16
Sept. 6.7	14.386	287	15.25	85	27.38	113	57.95	229	6.292	245	39.50	65	52.403	253	3.38	— 30
16.6	14.673	253	16.10	135	28.51	101	60.24	262	6.537	221	40.15	40	52.656	228	3.68	74
26.6	14.926	216	17.45	182	29.52	90	62.86	288	6.758	196	40.55	14	52.884	197	4.42	115
Oct. 6.6	15.142	176	19.27	221	30.42	76	65.74	312	6.954	168	40.69	— 8	53.081	165	5.57	151
16.6	15.318	133	21.48	252	31.18	60	68.86	326	7.122	141	40.61	32	53.246	132	7.08	180
26.5	15.451	87	24.00	271	31.78	43	72.12	336	7.263	111	40.29	48	53.378	98	8.88	202
Nov. 5.5	15.538	41	26.71	282	32.21	25	75.48	336	7.374	81	39.81	63	53.476	62	10.90	217
15.5	15.579	— 3	29.53	282	32.46	5	78.84	328	7.455	51	39.18	75	53.538	26	13.07	220
25.4	15.576	45	32.35	271	32.51	— 14	82.12	311	7.506	19	38.43	80	53.564	— 8	15.27	217
Dec. 5.4	15.531	89	35.06	249	32.37	35	85.23	287	7.525	— 12	37.63	84	53.556	42	17.44	205
15.4	15.442	128	37.55	219	32.02	51	88.10	252	7.513	43	36.79	84	53.514	76	19.49	186
25.4	15.314	163	39.74	183	31.51	69	90.62	209	7.470	74	35.95	82	53.438	106	21.35	161
35.3	15.151		41.57		30.82		92.71		7.396		35.13		53.332		22.96	
Mean Place	11.518		43.35		15.335		61.49		2.590		21.74		49.235		28.34	
Sec δ, Tan δ	1.318		−0.858		5.290		+5.195		1.002		+0.066		1.094		−0.444	
$D_\psi\alpha$, $D_\omega\alpha$	+0.05		+0.04		+0.16		−0.25		+0.06		0.00		+0.05		+0.02	
$D_\psi\delta$, $D_\omega\delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7	

Washington Mean Time.	γ Persei. Mag. 3.1				ρ Persei. Var. 3.4–4.2				μ Horologii. Mag. 5.2				θ Hydri. Mag. 5.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 2 58		° ′ +53 11		h m 2 59		° ′ +38 31		h m 3 1		° ′ −60 2		h m 3 1		° ′ −72 12	
	s		″		s		″		s		″		s		″	
Jan. 0.3	58.194	177	40.06	96	61.226	117	49.66	42	43.83	35	77.39	163	66.74	62	81.26	150
10.3	58.017	221	41.02	57	61.109	151	50.08	14	43.48	38	79.02	109	66.12	70	82.76	92
20.3	57.796	255	41.59	14	60.958	178	50.22	— 15	43.10	40	80.11	52	65.42	72	83.68	34
30.3	57.541	277	41.73	— 29	60.780	197	50.07	42	42.70	41	80.63	— 7	64.70	73	84.02	— 27
Feb. 9.2	57.264	285	41.44	70	60.583	204	49.65	72	42.29	42	80.56	63	63.97	73	83.75	84
19.2	56.979	278	40.74	109	60.379	202	48.93	95	41.87	39	79.93	117	63.24	71	82.91	140
Mar. 1.2	56.701	255	39.65	143	60.177	187	47.98	116	41.48	38	78.76	167	62.53	65	81.51	190
11.2	56.446	218	38.22	171	59.990	159	46.82	131	41.10	34	77.09	213	61.88	59	79.61	234
21.1	56.228	169	36.51	190	59.831	122	45.51	141	40.76	29	74.96	254	61.29	52	77.27	275
31.1	56.059	108	34.61	203	59.709	76	44.10	143	40.47	24	72.42	289	60.77	43	74.52	307
Apr. 10.1	55.951	39	32.58	207	59.633	24	42.67	140	40.23	16	69.53	317	60.34	32	71.45	332
20.0	55.912	— 33	30.51	203	59.609	— 33	41.27	130	40.07	10	66.36	337	60.02	20	68.13	351
30.0	55.945	108	28.48	190	59.642	93	39.97	113	39.97	1	62.99	353	59.82	8	64.62	361
May 10.0	56.053	181	26.58	169	59.735	149	38.84	94	39.96	— 6	59.46	356	59.74	— 3	61.01	363
20.0	56.234	248	24.89	145	59.884	202	37.90	68	40.02	15	55.90	353	59.77	17	57.38	356
29.9	56.482	309	23.44	113	60.086	251	37.22	42	40.17	22	52.37	343	59.94	28	53.82	342
June 8.9	56.791	362	22.31	81	60.337	292	36.80	12	40.39	28	48.94	324	60.22	39	50.40	319
18.9	57.153	404	21.50	45	60.629	326	36.68	— 17	40.67	34	45.70	294	60.61	48	47.21	287
28.9	57.557	439	21.05	7	60.955	352	36.85	44	41.01	40	42.76	259	61.09	57	44.34	248
July 8.8	57.996	458	20.98	— 29	61.307	367	37.29	72	41.41	43	40.17	215	61.66	65	41.86	202
18.8	58.454	470	21.27	65	61.674	375	38.01	96	41.84	47	38.02	167	62.31	69	39.84	150
28.8	58.924	470	21.92	97	62.049	376	38.97	118	42.31	48	36.35	110	63.00	73	38.34	92
Aug. 7.7	59.394	463	22.89	128	62.425	368	40.15	135	42.79	48	35.25	52	63.73	73	37.42	33
17.7	59.857	446	24.17	156	62.793	353	41.50	149	43.27	46	34.73	— 9	64.46	72	37.09	— 29
27.7	60.303	422	25.73	178	63.146	335	42.99	162	43.73	45	34.82	69	65.18	69	37.38	92
Sept. 6.7	60.725	393	27.51	199	63.481	310	44.61	168	44.18	41	35.51	128	65.87	62	38.30	150
16.6	61.118	357	29.50	216	63.791	284	46.29	171	44.59	36	36.79	185	66.49	55	39.80	204
26.6	61.475	318	31.66	226	64.075	253	48.00	173	44.95	30	38.64	234	67.04	46	41.84	253
Oct. 6.6	61.793	277	33.92	235	64.328	220	49.73	171	45.25	24	40.98	274	67.50	34	44.37	291
16.6	62.070	230	36.27	237	64.548	187	51.44	165	45.49	17	43.72	304	67.84	23	47.28	319
26.5	62.300	181	38.64	236	64.735	149	53.09	159	45.66	8	46.76	324	68.07	9	50.47	335
Nov. 5.5	62.481	128	41.00	231	64.884	110	54.68	150	45.74	2	50.00	330	68.16	— 4	53.82	339
15.5	62.609	74	43.31	217	64.994	71	56.18	137	45.76	— 5	53.30	325	68.12	16	57.21	331
25.4	62.683	17	45.48	202	65.065	28	57.55	121	45.71	13	56.55	307	67.96	28	60.52	308
Dec. 5.4	62.700	— 41	47.50	180	65.093	— 14	58.76	104	45.58	20	59.62	280	67.68	39	63.60	276
15.4	62.659	98	49.30	151	65.079	57	59.80	82	45.38	26	62.42	241	67.29	51	66.36	235
25.4	62.561	151	50.81	118	65.022	96	60.62	58	45.12	32	64.83	195	66.78	58	68.71	185
35.3	62.410		51.99		64.926		61.20		44.80		66.78		66.20		70.56	
Mean Place	55.196		25.22		58.790		38.07		41.993		64.84		64.529		67.57	
Sec δ, Tan δ	1.669		+1.336		1.278		+0.796		2.003		−1.736		3.274		−3.118	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.09		−0.06		+0.08		−0.04		+0.03		+0.08		0.00		+0.15	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Persei. (*Algol.*) Var. 2.1–3.2				δ Arietis. Mag. 4.5				12 Eridani. Mag. 4.0				48 H. Cephei. Mag. 5.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 3 2		° ′ +40 38		h m 3 6		° ′ +19 25		h m 3 8		° ′ −29 17		h m 3 9		° ′ +77 26	
	s		″		s		″		s		″		s		″	
Jan. 0.4	56.031	120	52.30	52	61.730	85	22.91	26	39.479	130	87.83	156	66.48	61	37.75	189
10.3	55.911	157	52.82	23	61.645	115	22.65	35	39.349	158	89.39	120	65.87	74	39.64	136
20.3	55.754	185	53.05 —	7	61.530	137	22.30	44	39.191	178	90.59	82	65.13	83	41.00	81
30.3	55.569	205	52.98	39	61.393	155	21.86	53	39.013	194	91.41	40	64.30	88	41.81	23
Feb. 9.2	55.364	214	52.59	69	61.238	165	21.33	59	38.819	201	91.81	0	63.42	90	42.04 —	38
19.2	55.150	210	51.90	94	61.073	164	20.74	63	38.618	199	91.81	42	62.52	88	41.66	96
Mar. 1.2	54.940	196	50.96	119	60.909	154	20.11	66	38.419	189	91.39	82	61.64	81	40.70	149
11.2	54.744	168	49.77	135	60.755	134	19.45	64	38.230	167	90.57	120	60.83	72	39.21	196
21.1	54.576	130	48.42	147	60.621	104	18.81	59	38.063	140	89.37	156	60.11	57	37.25	233
31.1	54.446	82	46.95	152	60.517	67	18.22	51	37.923	103	87.81	187	59.54	42	34.92	263
Apr. 10.1	54.364	29	45.43	149	60.450	24	17.71	38	37.820	62	85.94	218	59.12	24	32.29	281
20.1	54.335 —	29	43.94	141	60.426 —	22	17.33	21	37.758	14	83.76	241	58.88	5	29.48	288
30.0	54.364	91	42.53	125	60.448	72	17.12	4	37.744 —	34	81.35	263	58.83 —	14	26.60	286
May 10.0	54.455	148	41.28	106	60.520	119	17.08 —	17	37.778	84	78.72	276	58.97	33	23.74	273
20.0	54.603	203	40.22	80	60.639	165	17.25	37	37.862	132	75.96	285	59.30	51	21.01	251
29.9	54.806	254	39.42	55	60.804	208	17.62	59	37.994	177	73.11	286	59.81	67	18.50	222
June 8.9	55.060	297	38.87	24	61.012	243	18.21	79	38.171	219	70.25	282	60.48	82	16.28	188
18.9	55.357	332	38.63 —	4	61.255	273	19.00	95	38.390	253	67.43	268	61.30	94	14.40	146
28.9	55.689	359	38.67	35	61.528	295	19.95	112	38.643	279	64.75	248	62.24	103	12.94	102
July 8.8	56.048	375	39.02	63	61.823	312	21.07	123	38.922	301	62.27	222	63.27	111	11.92	55
18.8	56.423	385	39.65	89	62.135	318	22.30	130	39.223	313	60.05	189	64.38	115	11.37	9
28.8	56.808	385	40.54	112	62.453	319	23.60	134	39.536	319	58.16	149	65.53	117	11.28 —	39
Aug. 7.8	57.193	378	41.66	131	62.772	313	24.94	134	39.855	315	56.67	105	66.70	117	11.67	85
17.7	57.571	365	42.97	148	63.085	302	26.28	130	40.170	306	55.62	57	67.87	114	12.52	129
27.7	57.936	344	44.45	162	63.387	286	27.58	123	40.476	290	55.05	8 —	69.01	110	13.81	171
Sept. 6.7	58.280	322	46.07	170	63.673	266	28.81	111	40.766	268	54.97	40	70.11	103	15.52	208
16.6	58.602	293	47.77	176	63.939	244	29.92	100	41.034	242	55.37	89	71.14	95	17.60	241
26.6	58.895	263	49.53	179	64.183	217	30.92	87	41.276	212	56.26	132	72.09	85	20.01	272
Oct. 6.6	59.158	230	51.32	179	64.400	192	31.79	71	41.488	179	57.58	172	72.94	72	22.73	294
16.6	59.388	194	53.11	176	64.592	162	32.50	58	41.667	145	59.30	203	73.66	60	25.67	313
26.5	59.582	157	54.87	170	64.754	134	33.08	44	41.812	107	61.33	225	74.26	46	28.80	324
Nov. 5.5	59.739	116	56.57	161	64.888	101	33.52	32	41.919	69	63.58	241	74.72	28	32.04	327
15.5	59.855	75	58.18	149	64.989	69	33.84	19	41.988	31	65.99	245	75.00	13	35.31	323
25.5	59.930	31	59.67	135	65.058	35	34.03	10	42.019 —	6	68.44	241	75.13 —	5	38.54	308
Dec. 5.4	59.961 —	13	61.02	115	65.093	2 —	34.13 —	1	42.013	43	70.85	227	75.08	21	41.62	288
15.4	59.948	57	62.17	94	65.095	35	34.12	11	41.970	80	73.12	205	74.87	38	44.50	257
25.4	59.891	101	63.11	68	65.060	68	34.01	21	41.890	114	75.17	177	74.49	53	47.07	216
35.3	59.790		63.79		64.992		33.80		41.776		76.94		73.96		49.23	
Mean Place	53.513		40.41		59.641		16.67		37.749		80.91		59.384		20.41	
Sec δ, Tan δ	1.318		+0.859		1.060		+0.353		1.147		−0.561		4.599		+4.489	
$D_\psi \alpha$, $D_\omega \alpha$	+0.08		−0.04		+0.07		−0.02		+0.05		+0.03		+0.15		−0.20	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Arietis. Mag. 5.0				38 G. Horologii. Mag. 5.7				ζ Eridani. Mag. 4.9				τ Arietis. Mag. 5.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 10		+20 44		3 10		−57 36		3 11		− 9 6		3 16		+20 51	
	s		″		s		″		s		″		s		″	
Jan. 0.4	16.643		48.59		31.688		100.71		55.678		73.03		35.006		27.29	
10.3	16.559	84	48.37	22	31.387	301	102.46	175	55.588	90	74.20	117	34.926	80	27.09	20
20.3	16.445	114	48.07	30	31.048	339	103.68	122	55.472	116	75.19	99	34.815	111	26.81	28
30.3	16.307	138	47.66	41	30.683	365	104.35	67	55.331	141	75.99	80	34.678	137	26.43	38
Feb. 9.2	16.150	157	47.16	50	30.301	382	104.45	10	55.176	155	76.54	55	34.522	156	25.95	48
19.2	15.983	167	46.58	58	29.915	386	103.98	47	55.012	164	76.87	33	34.354	168	25.40	55
Mar. 1.2	15.817	166	45.93	65	29.537	378	102.98	100	54.847	165	76.94	7	34.185	169	24.78	62
11.2	15.660	157	45.26	67	29.180	357	101.46	152	54.692	155	76.77	17	34.026	159	24.12	66
21.1	15.523	137	44.58	68	28.857	323	99.49	197	54.553	139	76.34	43	33.885	141	23.46	66
31.1	15.415	108	43.93	65	28.577	280	97.09	240	54.441	112	75.66	68	33.772	113	22.83	63
Apr. 10.1	15.344	71	43.36	57	28.351	226	94.33	276	54.361	80	74.72	94	33.695	77	22.27	56
20.1	15.316	28	42.91	45	28.187	164	91.27	306	54.321	40	73.54	118	33.661	34	21.81	46
30.0	15.335	19	42.62	29	28.092	95	87.99	328	54.324	3	72.14	140	33.674	13	21.50	31
May 10.0	15.403	68	42.49	13	28.069	23	84.56	343	54.371	47	70.53	161	33.736	62	21.36	14
20.0	15.520	117	42.56	7	28.121	52	81.02	354	54.466	95	68.73	180	33.847	111	21.41	5
29.9	15.683	163	42.85	29	28.245	124	77.51	351	54.603	137	66.80	193	34.005	158	21.67	26
June 8.9	15.889	206	43.34	49	28.441	196	74.08	343	54.781	178	64.75	205	34.206	201	22.12	45
18.9	16.132	243	44.04	70	28.701	260	70.81	327	54.994	213	62.66	209	34.443	237	22.79	67
28.9	16.405	273	44.92	88	29.020	319	67.81	300	55.239	245	60.56	210	34.712	269	23.63	84
July 8.8	16.700	295	45.96	104	29.388	368	65.15	266	55.506	267	58.53	203	35.005	293	24.62	99
18.8	17.013	313	47.13	117	29.795	407	62.90	225	55.790	284	56.62	191	35.316	311	25.75	113
28.8	17.333	320	48.38	125	30.229	434	61.12	178	56.085	295	54.87	175	35.635	319	26.97	122
Aug. 7.8	17.654	321	49.69	131	30.680	451	59.88	124	56.383	298	53.37	150	35.956	321	28.23	126
17.7	17.970	316	51.01	132	31.134	454	59.22	66	56.675	292	52.12	125	36.273	317	29.51	128
27.7	18.274	304	52.30	129	31.578	444	59.17	5	56.958	283	51.21	91	36.579	306	30.76	125
Sept. 6.7	18.564	290	53.53	123	32.003	425	59.72	55	57.228	270	50.63	58	36.872	293	31.95	119
16.6	18.834	270	54.66	113	32.394	391	60.88	116	57.479	251	50.40	23	37.146	274	33.06	111
26.6	19.081	247	55.68	102	32.743	349	62.59	171	57.708	229	50.55	15	37.397	251	34.06	100
Oct. 6.6	19.303	222	56.59	91	33.042	299	64.80	221	57.910	202	51.02	47	37.625	228	34.94	88
16.6	19.500	197	57.37	78	33.281	239	67.45	265	58.086	176	51.80	78	37.826	201	35.68	74
26.5	19.666	166	57.99	62	33.457	176	70.42	297	58.233	147	52.86	106	38.000	174	36.30	62
Nov. 5.5	19.803	137	58.50	51	33.564	107	73.61	319	58.351	118	54.11	125	38.144	144	36.80	50
15.5	19.908	105	58.89	39	33.604	40	76.89	328	58.437	86	55.54	143	38.257	113	37.18	38
25.5	19.981	73	59.15	26	33.573	31	80.15	326	58.492	55	57.04	150	38.336	79	37.44	26
Dec. 5.4	20.019	38	59.32	17	33.474	99	83.26	311	58.514	22	58.58	154	38.382	46	37.61	17
15.4	20.023	4	59.38	6	33.312	162	86.12	286	58.503	11	60.09	151	38.392	10	37.67	6
25.4	19.991	32	59.34	4	33.091	221	88.62	250	58.461	42	61.50	141	38.365	27	37.64	3
35.3	19.925	66	59.20	14	32.818	273	90.68	206	58.387	74	62.80	130	38.303	62	37.52	12
Mean Place	14.519		42.16		29.823		88.59		53.853		71.18		32.848		21.16	
Sec δ, Tan δ	1.069		+0.379		1.867		−1.577		1.013		−0.161		1.070		+0.381	
Dψα, Dωα	+0.07		−0.02		+0.03		+0.07		+0.06		+0.01		+0.07		−0.02	
Dψδ, Dωδ	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*e* Eridani. Mag. 4.3				ι Hydri. Mag. 5.5				α Persei. Mag. 1.9				ο Tauri. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 16		−43 22		3 17		−77 40		3 18		+49 34		3 20		+ 8 44	
	s		″		s		″		s		″		s		″	
Jan. 0.4	43.338	175	53.70	178	59.91	93	79.15	164	34.850	138	39.05	97	29.131	76	43.63	64
10.3	43.163	207	55.48	134	58.98	101	80.79	110	34.712	185	40.02	63	29.055	104	42.99	62
20.3	42.956	231	56.82	85	57.97	107	81.89	47	34.527	222	40.65	25	28.951	130	42.37	59
30.3	42.725	248	57.67	35	56.90	110	82.36	10	34.305	247	40.90	13	28.821	149	41.78	55
Feb. 9.3	42.477	256	58.02	16	55.80	110	82.26	68	34.058	263	40.77	50	28.672	158	41.23	50
19.2	42.221	253	57.86	67	54.70	107	81.58	126	33.795	260	40.27	88	28.514	161	40.73	43
Mar. 1.2	41.968	240	57.19	113	53.63	101	80.32	174	33.535	246	39.39	120	28.353	154	40.30	35
11.2	41.728	218	56.06	157	52.62	93	78.58	220	33.289	217	38.19	146	28.199	138	39.95	23
21.1	41.510	187	54.49	199	51.69	83	76.38	263	33.072	174	36.73	168	28.061	111	39.72	12
31.1	41.323	145	52.50	233	50.86	69	73.75	295	32.898	122	35.05	181	27.950	78	39.60	3
Apr. 10.1	41.178	98	50.17	266	50.17	56	70.80	322	32.776	60	33.24	186	27.872	38	39.63	21
20.1	41.080	44	47.51	291	49.61	39	67.58	341	32.716	7	31.38	184	27.834	5	39.84	38
30.0	41.036	11	44.60	311	49.22	24	64.17	356	32.723	75	29.54	175	27.839	52	40.22	56
May 10.0	41.047	68	41.49	323	48.98	6	60.61	360	32.798	144	27.79	158	27.891	98	40.78	77
20.0	41.115	125	38.26	328	48.92	12	57.01	353	32.942	209	26.21	136	27.989	141	41.55	95
30.0	41.240	178	34.98	325	49.04	28	53.48	342	33.151	267	24.85	110	28.130	184	42.50	112
June 8.9	41.418	228	31.73	315	49.32	45	50.06	319	33.418	321	23.75	80	28.314	219	43.62	125
18.9	41.646	272	28.58	295	49.77	59	46.87	292	33.739	363	22.95	49	28.533	251	44.87	136
28.9	41.918	307	25.63	268	50.36	73	43.95	254	34.102	398	22.46	15	28.784	273	46.23	143
July 8.8	42.225	335	22.95	236	51.09	84	41.41	210	34.500	421	22.31	17	29.057	289	47.66	146
18.8	42.560	355	20.59	194	51.93	92	39.31	160	34.921	435	22.48	49	29.346	300	49.12	145
28.8	42.915	365	18.65	146	52.85	99	37.71	101	35.356	441	22.97	79	29.646	303	50.57	138
Aug. 7.8	43.280	365	17.19	94	53.84	101	36.70	43	35.797	437	23.76	108	29.949	300	51.95	128
17.7	43.645	358	16.25	39	54.85	101	36.27	16	36.234	426	24.84	131	30.249	291	53.23	112
27.7	44.003	342	15.86	18	55.86	98	36.43	80	36.660	406	26.15	153	30.540	278	54.35	96
Sept. 6.7	44.345	318	16.04	74	56.84	91	37.23	142	37.066	384	27.68	172	30.818	259	55.31	75
16.7	44.663	288	16.78	129	57.75	81	38.65	193	37.450	355	29.40	185	31.077	240	56.06	54
26.6	44.951	254	18.07	179	58.56	68	40.58	245	37.805	322	31.25	198	31.317	216	56.60	32
Oct. 6.6	45.205	211	19.86	219	59.24	53	43.03	285	38.127	285	33.23	204	31.533	192	56.92	11
16.6	45.416	169	22.05	256	59.77	36	45.88	316	38.412	245	35.27	209	31.725	165	57.03	7
26.5	45.585	122	24.61	279	60.13	17	49.04	333	38.657	201	37.36	210	31.890	138	56.96	25
Nov. 5.5	45.707	74	27.40	294	60.30	1	52.37	341	38.858	154	39.46	206	32.028	106	56.71	39
15.5	45.781	25	30.34	297	60.29	21	55.78	335	39.012	104	41.52	197	32.134	75	56.32	49
25.5	45.806	22	33.31	289	60.08	39	59.13	315	39.116	50	43.49	185	32.209	44	55.83	57
Dec. 5.4	45.784	69	36.20	268	59.69	56	62.28	287	39.166	5	45.34	166	32.253	9	55.26	62
15.4	45.715	113	38.88	242	59.13	72	65.15	246	39.161	59	47.00	145	32.262	25	54.64	64
25.4	45.602	154	41.30	205	58.41	85	67.61	198	39.102	112	48.45	116	32.237	58	54.00	65
35.4	45.448		43.35		57.56		69.59		38.990		49.61		32.179		53.35	
Mean Place	41.552		43.88		56.939		65.55		31.876		26.37		27.115		40.90	
Sec δ, Tan δ	1.376		−0.945		4.688		−4.580		1.542		+1.174		1.012		+0.154	
$D_\psi \alpha$, $D_\omega \alpha$	+0.04		+0.04		−0.03		+0.20		+0.08		−0.05		+0.06		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.8		+0.3		+0.8		+0.3		+0.8		+0.3		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	2 H. Camelop. Mag. 4.4				ξ Tauri. Mag. 3.8				*f* Tauri. Mag. 4.3				ε Eridani. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 22		+59 39		3 22		+ 9 27		3 26		+12 39		3 29		− 9 43	
	s		″		s		″		s		″		s		″	
Jan. 0.4	33.578	196	47.70	140	48.658	73	6.44	62	26.012	71	39.52	49	8.676	87	56.17	126
10.3	33.382	255	49.10	99	48.585	102	5.82	61	25.941	102	39.03	50	8.589	115	57.43	106
20.3	33.127	302	50.09	54	48.483	129	5.21	57	25.839	129	38.53	51	8.474	140	58.49	85
30.3	32.825	336	50.63	7	48.354	148	4.64	55	25.710	149	38.02	52	8.334	158	59.34	60
Feb. 9.3	32.489	353	50.70	39	48.206	158	4.09	49	25.561	161	37.50	50	8.176	169	59.94	35
19.2	32.136	351	50.31	85	48.048	162	3.60	44	25.400	164	37.00	48	8.007	172	60.29	10
Mar. 1.2	31.785	331	49.46	127	47.886	155	3.16	36	25.236	159	36.52	43	7.835	164	60.39	16
11.2	31.454	294	48.19	162	47.731	139	2.80	26	25.077	142	36.09	37	7.671	150	60.23	42
21.1	31.160	239	46.57	191	47.592	113	2.54	14	24.935	116	35.72	27	7.521	125	59.81	68
31.1	30.921	174	44.66	213	47.479	79	2.40	0	24.819	82	35.45	16	7.396	94	59.13	93
Apr. 10.1	30.747	95	42.53	224	47.400	41	2.40	17	24.737	43	35.29	1	7.302	54	58.20	118
20.1	30.652	12	40.29	227	47.359	3	2.57	33	24.694	2	35.28	14	7.248	13	57.02	141
30.0	30.640	75	38.02	222	47.362	50	2.90	53	24.696	48	35.42	34	7.235	33	55.61	162
May 10.0	30.715	160	35.80	208	47.412	96	3.43	71	24.744	95	35.76	52	7.268	79	53.99	180
20.0	30.875	243	33.72	188	47.508	140	4.14	90	24.839	140	36.28	71	7.347	123	52.19	194
30.0	31.118	317	31.84	160	47.648	182	5.04	106	24.979	182	36.99	87	7.470	164	50.25	203
June 8.9	31.435	384	30.24	130	47.830	220	6.10	120	25.161	220	37.86	104	7.634	202	48.22	210
18.9	31.819	441	28.94	96	48.050	250	7.30	133	25.381	250	38.90	117	7.836	232	46.12	209
28.9	32.260	485	27.98	57	48.300	273	8.63	140	25.631	275	40.07	126	8.068	259	44.03	203
July 8.8	32.745	517	27.41	20	48.573	290	10.03	143	25.906	292	41.33	133	8.327	277	42.00	191
18.8	33.262	538	27.21	18	48.863	300	11.46	145	26.198	304	42.66	134	8.604	288	40.09	173
28.8	33.800	547	27.39	55	49.163	304	12.91	135	26.502	307	44.00	131	8.892	294	38.36	151
Aug. 7.8	34.347	545	27.94	90	49.467	301	14.26	127	26.809	303	45.31	125	9.186	292	36.85	122
17.7	34.892	532	28.84	123	49.768	293	15.53	112	27.112	297	46.56	113	9.478	285	35.63	91
27.7	35.424	514	30.07	154	50.061	279	16.65	96	27.409	284	47.69	101	9.763	273	34.72	55
Sept. 6.7	35.938	484	31.61	179	50.340	261	17.61	76	27.693	267	48.70	84	10.036	255	34.17	19
16.7	36.422	450	33.40	204	50.601	242	18.37	57	27.960	247	49.54	67	10.291	235	33.98	18
26.6	36.872	408	35.44	222	50.843	219	18.94	35	28.207	225	50.21	48	10.526	212	34.16	51
Oct. 6.6	37.280	362	37.66	237	51.062	195	19.29	14	28.432	200	50.69	28	10.738	186	34.67	85
16.6	37.642	310	40.03	248	51.257	167	19.43	5	28.632	174	50.97	13	10.924	158	35.52	113
26.5	37.952	253	42.51	253	51.424	140	19.38	22	28.806	147	51.10	2	11.082	129	36.65	134
Nov. 5.5	38.205	189	45.04	254	51.564	109	19.16	34	28.953	116	51.08	16	11.211	98	37.99	151
15.5	38.394	125	47.58	249	51.673	79	18.82	46	29.069	84	50.92	28	11.309	66	39.50	161
25.5	38.519	52	50.07	237	51.752	46	18.36	53	29.153	53	50.64	34	11.375	32	41.11	163
Dec. 5.4	38.571	19	52.44	218	51.798	12	17.83	59	29.206	16	50.30	41	11.407	2	42.74	160
15.4	38.552	93	54.62	194	51.810	22	17.24	61	29.222	19	49.89	44	11.405	36	44.34	151
25.4	38.459	161	56.56	161	51.788	56	16.63	61	29.203	54	49.45	48	11.369	69	45.85	137
35.4	38.298		58.17		51.732		16.02		29.149		48.97		11.300		47.22	
Mean Place	29.918		33.58		46.625		3.61		23.923		36.02		6.792		53.62	
Sec δ, Tan δ	1.980		+1.709		1.014		+0.167		1.025		+0.225		1.015		−0.171	
$D_\psi \alpha$, $D_\omega \alpha$	+0.10		−0.07		+0.06		−0.01		+0.06		−0.01		+0.06		+0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.8		+0.3		+0.8		+0.2		+0.8		+0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**τ^5 Eridani.** Mag. 4.3				**δ Persei.** Mag. 3.1				**δ Eridani.** Mag. 3.7				**ν Persei.** Mag. 3.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 3 30		° ′ −21 53		h m 3 37		° ′ +47 31		h m 3 39		° ′ −10 1		h m 3 39		° ′ +42 19	
	s		″		s		″		s		″		s		″	
Jan. 0.4	14.346	100	79.48	160	12.035	112	57.86	101	23.978	77	75.70	131	43.921	93	35.64	79
10.3	14.246	131	81.08	131	11.923	160	58.87	70	23.901	108	77.01	110	43.828	138	36.43	54
20.3	14.115	157	82.39	99	11.763	200	59.57	37	23.793	134	78.11	90	43.690	177	36.97	25
30.3	13.958	175	83.38	63	11.563	231	59.94	2	23.659	154	79.01	65	43.513	206	37.22	4
Feb. 9.3	13.783	186	84.01	27	11.332	249	59.96	34	23.505	169	79.66	40	43.307	223	37.18	36
19.2	13.597	189	84.28	9	11.083	255	59.62	68	23.336	173	80.06	14	43.084	229	36.82	65
Mar. 1.2	13.408	183	84.19	43	10.828	245	58.94	100	23.163	170	80.20	13	42.855	222	36.17	91
11.2	13.225	167	83.76	79	10.583	221	57.94	127	22.993	155	80.07	38	42.633	201	35.26	116
21.2	13.058	143	82.97	112	10.362	184	56.67	148	22.838	133	79.69	65	42.432	168	34.10	130
31.1	12.915	110	81.85	142	10.178	138	55.19	165	22.705	103	79.04	90	42.264	125	32.80	142
Apr. 10.1	12.805	71	80.43	173	10.040	79	53.54	171	22.602	66	78.14	116	42.139	73	31.38	148
20.1	12.734	28	78.70	198	9.961	17	51.83	172	22.536	24	76.98	139	42.066	16	29.90	146
30.0	12.706	18	76.72	220	9.944	49	50.11	164	22.512	21	75.59	160	42.050	45	28.44	139
May 10.0	12.724	66	74.52	237	9.993	115	48.47	153	22.533	66	73.99	179	42.095	106	27.05	124
20.0	12.790	113	72.15	250	10.108	178	46.94	134	22.599	111	72.20	194	42.201	164	25.81	107
30.0	12.903	156	69.65	256	10.286	239	45.60	111	22.710	152	70.26	204	42.365	220	24.74	85
June 8.9	13.059	197	67.09	257	10.525	290	44.49	85	22.862	192	68.22	212	42.585	268	23.89	60
18.9	13.256	230	64.52	250	10.815	336	43.64	56	23.054	225	66.10	211	42.853	309	23.29	33
28.9	13.486	259	62.02	238	11.151	370	43.08	25	23.279	252	63.99	207	43.162	343	22.96	7
July 8.9	13.745	281	59.64	217	11.521	398	42.83	3	23.531	272	61.92	195	43.505	367	22.89	20
18.8	14.026	295	57.47	191	11.919	415	42.86	33	23.803	285	59.97	179	43.872	383	23.09	45
28.8	14.321	302	55.56	158	12.334	423	43.19	62	24.088	293	58.18	156	44.255	391	23.54	70
Aug. 7.8	14.623	303	53.98	120	12.757	424	43.81	86	24.381	203	56.62	127	44.646	392	24.24	90
17.7	14.926	297	52.78	78	13.181	418	44.67	110	24.674	288	55.35	97	45.038	385	25.14	108
27.7	15.223	285	52.00	34	13.599	402	45.77	130	24.962	278	54.38	60	45.423	374	26.22	125
Sept. 6.7	15.508	268	51.66	11	14.001	385	47.07	147	25.240	263	53.78	24	45.797	354	27.47	137
16.7	15.776	246	51.77	57	14.386	359	48.54	162	25.503	245	53.54	13	46.151	334	28.84	147
26.6	16.022	221	52.34	99	14.745	332	50.16	173	25.748	223	53.67	48	46.485	307	30.31	154
Oct. 6.6	16.243	194	53.33	138	15.077	298	51.89	181	25.971	198	54.15	82	46.792	278	31.85	159
16.6	16.437	164	54.71	170	15.375	262	53.70	187	26.169	172	54.97	112	47.070	245	33.44	161
26.6	16.601	130	56.41	195	15.637	221	55.57	189	26.341	144	56.09	133	47.315	209	35.05	161
Nov. 5.5	16.731	98	58.36	214	15.858	178	57.46	188	26.485	112	57.42	152	47.524	169	36.66	158
15.5	16.829	62	60.50	222	16.036	129	59.34	182	26.597	81	58.94	163	47.693	125	38.24	153
25.5	16.891	25	62.72	222	16.165	79	61.16	174	26.678	47	60.57	166	47.818	80	39.77	144
Dec. 5.4	16.916	11	64.94	213	16.244	25	62.90	159	26.725	12	62.23	162	47.898	31	41.21	131
15.4	16.905	47	67.07	200	16.269	31	64.49	141	26.737	24	63.85	155	47.929	19	42.52	113
25.4	16.858	83	69.07	177	16.238	84	65.90	116	26.713	57	65.40	142	47.910	68	43.65	95
35.4	16.775		70.84		16.154		67.06		26.656		66.82		47.842		44.60	
Mean Place	12.499		74.13		9.027		47.01		22.040		73.01		41.113		25.99	
Sec δ, Tan δ	1.078		−0.402		1.481		+1.093		1.016		−0.177		1.353		+0.911	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		+0.02		+0.08		−0.04		+0.06		+0.01		+0.08		−0.04	
$D_\psi \delta$, $D_\omega \delta$	+0.2		+0.8		+0.2		+0.8		+0.2		+0.8		+0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	5 H. Camelop. Mag. 4.7				η Tauri. (*Alcyone.*) Mag. 3.0				τ^6 Eridani. Mag. 4.3				*g* Eridani. Mag. 4.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 3 41		° ′ +71 4		h m 3 42		° ′ +23 51		h m 3 43		° ′ −23 28		h m 3 46		° ′ −36 26	
	s		″		s		″		s		″		s		″	
Jan. 0.4	52.57		77.06		42.303		25.66		23.658		80.94		27.332		49.22	
10.4	52.26	31	79.03	197	42.239	64	25.66	0	23.562	96	82.68	174	27.200	132	51.24	202
20.3	51.84	42	80.56	153	42.139	100	25.55	11	23.432	130	84.13	145	27.032	168	52.88	164
30.3	51.35	49	81.61	105	42.006	133	25.32	23	23.275	157	85.24	111	26.835	197	54.08	120
Feb. 9.3	50.79	56	82.13	52	41.849	157	24.98	34	23.097	178	85.98	74	26.613	222	54.83	75
19.2	50.22	57	82.09	— 4	41.676	173	24.54	44	22.905	192	86.35	37	26.379	234	55.11	28
Mar. 1.2	49.63	59	81.51	58	41.496	180	24.01	53	22.708	197	86.35	0	26.140	239	54.92	— 19
11.2	49.06	57	80.42	109	41.321	175	23.39	62	22.514	194	85.97	38	25.905	235	54.28	64
21.2	48.54	52	78.85	157	41.162	159	22.73	66	22.335	179	85.23	74	25.688	217	53.19	109
31.1	48.12	42	76.89	196	41.026	136	22.05	68	22.180	155	84.14	109	25.494	194	51.70	149
Apr. 10.1	47.77	35	74.62	227	40.926	100	21.40	65	22.056	124	82.73	141	25.335	159	49.84	186
20.1	47.55	22	72.11	251	40.868	58	20.81	59	21.970	86	81.01	172	25.217	118	47.63	221
30.1	47.44	11	69.47	264	40.855	13	20.32	49	21.926	44	79.04	197	25.146	71	45.13	250
May 10.0	47.47	— 3	66.81	266	40.892	— 37	19.96	36	21.929	— 3	76.82	222	25.126	20	42.40	273
20.0	47.63	16	64.23	258	40.980	88	19.77	19	21.980	51	74.42	240	25.158	— 32	39.50	290
30.0	47.91	28	61.79	244	41.116	136	19.76	1	22.078	98	71.88	254	25.243	85	36.47	303
June 8.9	48.32	41	59.56	223	41.297	181	19.94	— 18	22.221	143	69.27	261	25.378	135	33.41	306
18.9	48.83	51	57.62	194	41.519	222	20.30	36	22.404	183	66.67	260	25.561	183	30.40	301
28.9	49.43	60	56.03	159	41.775	256	20.85	55	22.624	220	64.13	254	25.785	224	27.49	291
July 8.9	50.11	68	54.81	122	42.059	284	21.57	72	22.875	251	61.70	243	26.045	260	24.77	272
18.8	50.85	74	54.01	80	42.364	305	22.42	85	23.148	273	59.49	221	26.333	288	22.33	244
28.8	51.63	78	53.62	39	42.681	317	23.38	96	23.440	292	57.53	196	26.644	311	20.24	209
Aug. 7.8	52.44	81	53.66	— 4	43.005	324	24.41	103	23.740	300	55.91	162	26.968	324	18.56	168
17.8	53.26	82	54.12	46	43.330	325	25.49	108	24.043	303	54.68	123	27.298	330	17.34	122
27.7	54.07	81	54.98	86	43.649	319	26.58	109	24.343	300	53.87	81	27.626	328	16.63	71
Sept. 6.7	54.86	79	56.24	126	43.956	307	27.64	106	24.634	291	53.50	37	27.945	319	16.47	16
16.7	55.62	76	57.86	162	44.250	294	28.65	101	24.909	275	53.62	— 12	28.247	302	16.85	— 38
26.6	56.34	72	59.80	194	44.525	275	29.59	94	25.165	256	54.21	59	28.529	282	17.78	93
Oct. 6.6	57.00	66	62.05	225	44.778	253	30.45	86	25.398	233	55.24	103	28.784	255	19.22	144
16.6	57.59	59	64.55	250	45.009	231	31.21	76	25.603	205	56.66	142	29.007	223	21.09	187
26.6	58.10	51	67.24	269	45.213	204	31.87	66	25.779	176	58.44	178	29.195	188	23.36	227
Nov. 5.5	58.51	41	70.08	284	45.388	175	32.44	57	25.924	145	60.49	205	29.344	149	25.93	257
15.5	58.83	32	73.00	292	45.533	145	32.91	47	26.034	110	62.73	224	29.453	109	28.70	277
25.5	59.05	22	75.95	295	45.643	110	33.31	40	26.107	73	65.07	234	29.518	65	31.57	287
Dec. 5.5	59.15	10	78.83	288	45.717	74	33.62	31	26.144	37	67.42	235	29.539	21	34.42	285
15.4	59.12	— 3	81.56	273	45.752	35	33.84	22	26.142	— 2	69.70	228	29.515	— 24	37.16	274
25.4	58.98	14	84.07	251	45.749	— 3	33.99	15	26.102	40	71.83	213	29.447	68	39.68	252
35.4	58.73	25	86.27	220	45.705	44	34.04	5	26.025	77	73.75	192	29.337	110	41.92	224
Mean Place	47.039		63.18		39.967		20.24		21.756		75.14		25.414		40.87	
Sec δ, Tan δ	3.085		+2.919		1.093		+0.442		1.090		−0.435		1.243		−0.738	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.12		−0.11		+0.07		−0.02		+0.05		+0.02		+0.04		+0.03	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.2		+0.8		+0.2		+0.8		+0.2		+0.8		+0.2		+0.8	

Washington Mean Time.	γ Hydri. Mag. 3.2				ζ Persei. Mag. 2.9				9 H. Camelop. Mag. 5.2				ε Persei. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 48		−74 28		3 49		+31 38		3 50		+60 52		3 52		+39 46	
	s		″		s		″		s		″		s		″	
Jan. 0.4	31.63		87.58		4.704		45.66		17.16		34.50		27.615		45.55	
10.4	30.97	66	89.69	211	4.637	67	46.02	36	16.98	18	36.15	165	27.539	76	46.29	74
20.3	30.23	74	91.27	158	4.530	107	46.21	19	16.75	23	37.42	127	27.417	122	46.81	52
30.3	29.40	83	92.28	101	4.389	141	46.23	2	16.45	30	38.29	87	27.256	161	47.08	27
Feb. 9.3	28.54	86	92.71	43	4.219	170	46.06	— 17	16.11	34	38.70	41	27.065	191	47.09	1
19.2	27.66	88	92.56	— 15	4.031	188	45.70	36	15.75	36	38.64	— 6	26.852	213	46.82	— 27
Mar. 1.2	26.78	88	91.85	71	3.835	196	45.16	54	15.37	38	38.12	52	26.631	221	46.29	53
11.2	25.93	85	90.59	126	3.643	192	44.45	71	15.01	36	37.17	95	26.415	216	45.50	79
21.2	25.14	79	88.84	175	3.466	177	43.62	83	14.67	34	35.80	137	26.214	201	44.51	99
31.1	24.41	73	86.64	220	3.317	149	42.70	92	14.39	28	34.09	171	26.044	170	43.35	116
Apr. 10.1	23.77	64	84.04	260	3.203	114	41.74	96	14.16	23	32.13	196	25.913	131	42.09	126
20.1	23.24	53	81.10	294	3.133	70	40.78	96	14.02	14	29.97	216	25.830	83	40.76	133
30.1	22.84	40	77.91	319	3.113	20	39.87	91	13.95	7	27.72	225	25.801	29	39.45	131
May 10.0	22.56	28	74.52	339	3.146	— 33	39.07	80	13.97	— 2	25.46	226	25.831	— 30	38.20	125
20.0	22.42	14	71.00	352	3.232	86	38.41	66	14.08	11	23.26	220	25.919	88	37.07	113
30.0	22.41	1	67.46	354	3.370	138	37.92	49	14.28	20	21.22	204	26.065	146	36.09	98
June 8.9	22.56	— 15	63.97	349	3.557	187	37.63	29	14.57	29	19.37	185	26.264	199	35.33	76
18.9	22.84	28	60.61	336	3.788	231	37.53	10	14.92	35	17.79	158	26.511	247	34.77	56
28.9	23.24	40	57.48	313	4.056	268	37.65	— 12	15.34	42	16.53	126	26.800	289	34.46	31
July 8.9	23.76	52	54.65	283	4.354	298	37.98	33	15.81	47	15.58	95	27.122	322	34.40	6
18.8	24.39	63	52.22	243	4.675	321	38.49	51	16.32	51	15.00	58	27.470	348	34.57	— 17
28.8	25.10	71	50.25	197	5.011	336	39.18	69	16.86	54	14.78	22	27.836	366	34.97	40
Aug. 7.8	25.87	77	48.80	145	5.356	345	40.00	82	17.42	56	14.93	— 15	28.212	376	35.58	61
17.8	26.68	81	47.94	86	5.702	346	40.94	94	17.99	57	15.42	49	28.591	379	36.38	80
27.7	27.50	82	47.68	26	6.043	341	41.97	103	18.55	56	16.27	85	28.967	376	37.33	95
Sept. 6.7	28.32	82	48.06	— 38	6.375	332	43.05	108	19.11	56	17.43	116	29.332	365	38.42	109
16.7	29.10	78	49.06	100	6.692	317	44.15	110	19.64	53	18.87	144	29.681	349	39.63	121
26.6	29.82	72	50.65	159	6.990	298	45.27	112	20.13	49	20.59	172	30.012	331	40.92	129
Oct. 6.6	30.44	62	52.79	214	7.268	278	46.37	110	20.60	47	22.52	193	30.320	308	42.26	134
16.6	30.97	53	55.41	262	7.520	252	47.44	107	21.02	42	24.67	215	30.602	282	43.64	138
26.6	31.37	40	58.42	301	7.746	226	48.47	103	21.39	37	26.96	229	30.853	251	45.04	140
Nov. 5.5	31.64	27	61.70	328	7.941	195	49.45	98	21.70	31	29.37	241	31.071	218	46.44	140
15.5	31.74	10	65.13	343	8.103	162	50.37	92	21.95	25	31.84	247	31.251	180	47.82	138
25.5	31.71	— 3	68.60	347	8.228	125	51.23	86	22.14	19	34.31	247	31.391	140	49.16	134
Dec. 5.5	31.51	20	71.97	337	8.313	85	52.02	79	22.25	11	36.73	242	31.486	95	50.43	127
15.4	31.18	33	75.11	314	8.357	44	52.70	68	22.28	3	39.04	231	31.534	48	51.59	116
25.4	30.71	47	77.94	283	8.358	1	53.28	58	22.23	— 5	41.14	210	31.532	— 2	52.63	104
35.4	30.12	59	80.34	240	8.314	— 44	53.74	46	22.11	12	42.99	185	31.482	50	53.50	87
Mean Place	28.590		74.95		2.169		38.89		13.126		22.62		24.826		37.36	
Sec δ, Tan δ	3.739		−3.602		1.175		+0.616		2.055		+1.795		1.301		+0.833	
Dψα, Dωα	−0.02		+0.13		+0.07		−0.02		+0.10		−0.06		+0.08		−0.03	
Dψδ, Dωδ	+0.2		+0.8		+0.2		+0.8		+0.2		+0.8		+0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Persei. Mag. 4.0				γ Eridani. Mag. 3.2				λ Tauri. Var. 3.3–4.2				δ Reticuli. Mag. 4.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 53		+35 33		3 54		−13 43		3 56		+12 15		3 57		−61 37	
	s		″		s		″		s		″		s		″	
Jan. 0.4	44.967		39.87		16.967		81.05		13.656		46.81		29.76		53.48	
		68		56		72		152		51		50		30		232
10.4	44.899		40.43		16.895		82.57		13.605		46.31		29.46		55.80	
		111		37		106		130		87		51		36		183
20.3	44.788		40.80		16.789		83.87		13.518		45.80		29.10		57.63	
		149		16		134		104		119		48		41		129
30.3	44.639		40.96	—	16.655		84.91		13.399		45.32		28.69		58.92	
		177		7		158		76		144		48		44		73
Feb. 9.3	44.462		40.89		16.497		85.67		13.255		44.84		28.25		59.65	
		198		30		174		48		162		45		47		16
19.3	44.264		40.59		16.323		86.15		13.093		44.39		27.78		59.81	—
		207		51		181		18		170		41		46		40
Mar. 1.2	44.057		40.08		16.142		86.33	—	12.923		43.98		27.32		59.41	
		204		73		179		12		169		38		46		96
11.2	43.853		39.35		15.963		86.21		12.754		43.60		26.86		58.45	
		189		89		167		40		156		31		43		146
21.2	43.664		38.46		15.796		85.81		12.598		43.29		26.43		56.99	
		160		102		147		70		137		22		39		194
31.1	43.504		37.44		15.649		85.11		12.461		43.07		26.04		55.05	
		124		110		117		97		105		12		34		235
Apr. 10.1	43.380		36.34		15.532		84.14		12.356		42.95		25.70		52.70	
		78		113		82		126		68		1		29		273
20.1	43.302		35.21		15.450		82.88		12.288		42.94	—	25.41		49.97	
		28		110		40		149		26		14		21		304
30.1	43.274	—	34.11		15.410	—	81.39		12.262	—	43.08		25.20		46.93	
		28		102		3		173		19		31		13		326
May 10.0	43.302		33.09		15.413		79.66		12.281		43.39		25.07		43.67	
		84		90		49		191		67		46		5		342
20.0	43.386		32.19		15.462		77.75		12.348		43.85		25.02	—	40.25	
		138		73		94		207		112		65		3		351
30.0	43.524		31.46		15.556		75.68		12.460		44.50		25.05		36.74	
		190		55		138		217		156		79		11		349
June 8.9	43.714		30.91		15.694		73.51		12.616		45.29		25.16		33.25	
		234		32		178		223		195		93		19		341
18.9	43.948		30.59		15.872		71.28		12.811		46.22		25.35		29.84	
		275		11		212		222		228		106		26		324
28.9	44.223		30.48	—	16.084		69.06		13.039		47.28		25.61		26.60	
		306		10		240		215		256		115		34		296
July 8.9	44.529		30.58		16.324		66.91		13.295		48.43		25.95		23.64	
		331		33		265		203		277		120		39		260
18.8	44.860		30.91		16.589		64.88		13.572		49.63		26.34		21.04	
		349		51		280		184		292		121		43		218
28.8	45.209		31.42		16.869		63.04		13.864		50.84		26.77		18.86	
		357		70		290		158		301		117		47		168
Aug. 7.8	45.566		32.12		17.159		61.46		14.165		52.01		27.24		17.18	
		360		85		293		128		303		111		49		113
17.8	45.926		32.97		17.452		60.18		14.468		53.12		27.73		16.05	
		357		96		291		94		300		101		49		51
27.7	46.283		33.93		17.743		59.24		14.768		54.13		28.22		15.54	—
		346		106		284		55		291		88		49		10
Sept. 6.7	46.629		34.99		18.027		58.69		15.059		55.01		28.71		15.64	
		333		113		271		15		280		69		48		73
16.7	46.962		36.12		18.298		58.54	—	15.339		55.70		29.19		16.37	
		315		118		254		25		265		53		44		135
26.6	47.277		37.30		18.552		58.79		15.604		56.23		29.63		17.72	
		293		120		234		64		245		35		38		193
Oct. 6.6	47.570		38.50		18.786		59.43		15.849		56.58		30.01		19.65	
		268		120		211		100		225		15		33		243
16.6	47.838		39.70		18.997		60.43		16.074		56.73	—	30.34		22.08	
		240		119		186		132		200		1		29		284
26.6	48.078		40.89		19.183		61.75		16.274		56.72		30.63		24.92	
		208		116		156		158		174		15		20		318
Nov. 5.5	48.286		42.05		19.339		63.33		16.448		56.57		30.83		28.10	
		174		113		126		176		147		28		13		336
15.5	48.460		43.18		19.465		65.09		16.595		56.29		30.96		31.46	
		135		109		94		188		114		37		4		345
25.5	48.595		44.27		19.559		66.97		16.709		55.92		31.00	—	34.91	
		95		101		58		192		81		44		5		341
Dec. 5.5	48.690		45.28		19.617		68.89		16.790		55.48		30.95		38.32	
		49		92		21		190		45		48		11		325
15.4	48.739		46.20		19.638	—	70.79		16.835		55.00		30.84		41.57	
		3		81		15		180		6		50		19		297
25.4	48.742	—	47.01		19.623		72.59		16.841	—	54.50		30.65		44.54	
		44		65		53		163		32		51		27		260
35.4	48.698		47.66		19.570		74.22		16.809		53.99		30.38		47.14	
Mean Place	42.305		32.63		14.987		77.23		11.446		44.79		27.451		41.95	
Sec δ, Tan δ	1.229		+0.715		1.029		−0.244		1.023		+0.217		2.104		−1.852	
$D_\psi a$, $D_\omega a$	+0.08		−0.03		+0.06		+0.01		+0.07		−0.01		+0.02		+0.06	
	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Tauri. Mag. 3.9				A Tauri. Mag. 4.5				c Persei. Mag. 4.0				p Tauri. Mag. 5.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 3 58		° ′ + 5 45		h m 3 59		° ′ +21 51		h m 4 2		° ′ +47 29		h m 4 5		° ′ +26 16	
	s		″		s		″		s		″		s		″	
Jan. 0.4	52.904	50	56.16	79	56.599	49	45.85	5	49.704	85	59.71	114	56.161	47	18.67	15
10.4	52.854	87	55.37	72	56.550	88	45.80	14	49.619	137	60.85	89	56.114	89	18.82	5
20.3	52.767	117	54.65	66	56.462	123	45.66	21	49.482	184	61.74	58	56.025	125	18.87	— 6
30.3	52.650	142	53.99	57	56.339	150	45.45	31	49.298	222	62.32	25	55.900	155	18.81	19
Feb. 9.3	52.508	161	53.42	47	56.189	169	45.14	37	49.076	246	62.57	— 9	55.745	174	18.62	31
19.3	52.347	169	52.95	37	56.020	179	44.77	45	48.830	260	62.48	42	55.571	186	18.31	43
Mar. 1.2	52.178	167	52.58	25	55.841	178	44.32	51	48.570	255	62.06	76	55.385	187	17.88	53
11.2	52.011	157	52.33	14	55.663	165	43.81	54	48.315	238	61.30	105	55.198	175	17.35	61
21.2	51.854	137	52.19	0	55.498	144	43.27	55	48.077	207	60.25	129	55.023	153	16.74	67
31.1	51.717	107	52.19	16	55.354	112	42.72	53	47.870	164	58.96	148	54.870	121	16.07	69
Apr. 10.1	51.610	72	52.35	31	55.242	73	42.19	47	47.706	111	57.48	161	54.749	81	15.38	67
20.1	51.538	30	52.66	49	55.169	29	41.72	38	47.595	50	55.87	166	54.668	35	14.71	61
30.1	51.508	— 14	53.15	67	55.140	— 19	41.34	25	47.545	— 14	54.21	163	54.633	— 14	14.10	51
May 10.0	51.522	59	53.82	84	55.159	69	41.09	11	47.559	81	52.58	156	54.647	65	13.59	38
20.0	51.581	105	54.66	100	55.228	118	40.98	— 4	47.640	145	51.02	143	54.712	115	13.21	22
30.0	51.686	148	55.66	117	55.346	161	41.02	23	47.785	205	49.59	124	54.827	162	12.99	6
June 9.0	51.834	185	56.83	127	55.507	204	41.25	39	47.990	261	48.35	103	54.989	205	12.93	— 11
18.9	52.019	220	58.10	136	55.711	239	41.64	55	48.251	310	47.32	77	55.194	243	13.04	29
28.9	52.239	248	59.46	141	55.950	270	42.19	69	48.561	349	46.55	50	55.437	273	13.33	45
July 8.9	52.487	269	60.87	142	56.220	291	42.88	81	48.910	381	46.05	23	55.710	297	13.78	59
18.8	52.756	284	62.29	138	56.511	308	43.69	90	49.291	404	45.82	— 4	56.007	314	14.37	73
28.8	53.040	293	63.67	130	56.819	316	44.59	96	49.695	417	45.86	31	56.321	325	15.10	81
Aug. 7.8	53.333	295	64.97	116	57.135	320	45.55	98	50.112	424	46.17	55	56.646	329	15.91	87
17.8	53.628	293	66.13	100	57.455	315	46.53	97	50.536	422	46.72	79	56.975	326	16.78	90
27.7	53.921	286	67.13	79	57.770	308	47.50	92	50.958	413	47.51	99	57.301	320	17.68	91
Sept. 6.7	54.207	275	67.92	57	58.078	296	48.42	86	51.371	399	48.50	118	57.621	308	18.59	89
16.7	54.482	258	68.49	32	58.374	281	49.28	78	51.770	381	49.68	133	57.929	294	19.48	85
26.7	54.740	242	68.81	9	58.655	262	50.06	67	52.151	356	51.01	147	58.223	276	20.33	79
Oct. 6.6	54.982	219	68.90	— 15	58.917	241	50.73	57	52.507	328	52.48	158	58.499	253	21.12	71
16.6	55.201	198	68.75	35	59.158	216	51.30	47	52.835	294	54.06	167	58.752	230	21.83	66
26.6	55.399	171	68.40	53	59.374	191	51.77	38	53.129	258	55.73	172	58.982	202	22.49	59
Nov. 5.5	55.570	143	67.87	68	59.565	159	52.15	29	53.387	214	57.45	175	59.184	172	23.08	53
15.5	55.713	112	67.19	78	59.724	127	52.44	20	53.601	168	59.20	174	59.356	139	23.61	47
25.5	55.825	78	66.41	84	59.851	92	52.64	15	53.769	116	60.94	170	59.495	100	24.08	41
Dec. 5.5	55.903	44	65.57	86	59.943	53	52.79	9	53.885	62	62.64	160	59.595	61	24.49	35
15.4	55.947	5	64.71	86	59.996	12	52.88	4	53.947	2	64.24	148	59.656	18	24.84	29
25.4	55.952	— 32	63.85	83	60.008	— 28	52.92	— 3	53.949	— 53	65.72	129	59.674	— 25	25.13	19
35.4	55.920		63.02		59.980		52.89		53.896		67.01		59.649		25.32	
Mean Place	50.761		55.73		54.226		41.91		46.541		50.96		53.677		14.15	
Sec δ, Tan δ	1.005		+0.101		1.078		+0.401		1.480		+1.091		1.115		+0.494	
Dψα, Dωα	+0.06		0.00		+0.07		−0.01		+0.09		−0.04		+0.07		−0.02	
Dψδ, Dωδ	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	o¹ Eridani. Mag. 4.1				μ Tauri. Mag. 4.3				α Horologii. Mag. 3.8				α Reticuli. Mag. 3.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 4 7		° ′ − 7 2		h m 4 11		° ′ + 8 41		h m 4 11		° ′ −42 29		h m 4 13		° ′ −62 40	
	s		″		s		″		s		″		s		″	
Jan. 0.4	56.711	55	54.89	135	10.275	40	26.25	68	21.115	138	46.88	236	25.08	30	46.08	250
10.4	56.656	89	56.24	116	10.235	78	25.57	64	20.977	181	49.24	195	24.78	36	48.58	203
20.3	56.567	122	57.40	97	10.157	112	24.93	57	20.796	217	51.19	151	24.42	43	50.61	151
30.3	56.445	146	58.37	75	10.045	139	24.36	52	20.579	245	52.70	102	23.99	46	52.12	95
Feb. 9.3	56.299	166	59.12	53	9.906	159	23.84	46	20.334	267	53.72	52	23.53	48	53.07	39
19.3	56.133	175	59.65	29	9.747	170	23.38	37	20.067	275	54.24	2	23.05	49	53.46	— 18
Mar. 1.2	55.958	176	59.94	7	9.577	171	23.01	30	19.792	274	54.26	— 49	22.56	49	53.28	73
11.2	55.782	165	60.01	— 19	9.406	162	22.71	19	19.518	261	53.77	96	22.07	46	52.55	126
21.2	55.617	148	59.82	43	9.244	144	22.52	10	19.257	238	52.81	139	21.61	43	51.29	175
31.2	55.469	121	59.39	67	9.100	115	22.42	— 3	19.019	205	51.42	182	21.18	37	49.54	219
Apr. 10.1	55.348	86	58.72	89	8.985	81	22.45	17	18.814	164	49.60	220	20.81	32	47.35	257
20.1	55.262	47	57.83	114	8.904	40	22.62	31	18.650	117	47.40	252	20.49	25	44.78	291
30.1	55.215	3	56.69	134	8.864	— 4	22.93	48	18.533	65	44.88	278	20.24	18	41.87	317
May 10.0	55.212	— 42	55.35	152	8.868	50	23.41	65	18.468	9	42.10	299	20.06	9	38.70	336
20.0	55.254	86	53.83	170	8.918	96	24.06	79	18.459	— 48	39.11	313	19.97	0	35.34	347
30.0	55.340	130	52.13	182	9.014	138	24.85	95	18.507	103	35.98	319	19.97	8	31.87	350
June 9.0	55.470	169	50.31	190	9.152	178	25.80	107	18.610	155	32.79	317	20.05	16	28.37	344
18.9	55.639	204	48.41	193	9.330	214	26.87	118	18.765	203	29.62	307	20.21	24	24.93	329
28.9	55.843	232	46.48	192	9.544	241	28.05	124	18.968	246	26.55	289	20.45	31	21.64	305
July 8.9	56.075	257	44.56	183	9.785	266	29.29	127	19.214	281	23.66	262	20.76	37	18.59	272
18.9	56.332	273	42.73	169	10.051	282	30.56	125	19.495	311	21.04	227	21.13	43	15.87	232
28.8	56.605	285	41.04	151	10.333	292	31.81	118	19.806	332	18.77	186	21.56	46	13.55	183
Aug. 7.8	56.890	290	39.53	126	10.625	297	32.99	109	20.138	343	16.91	137	22.02	50	11.72	129
17.8	57.180	289	38.27	99	10.922	296	34.08	96	20.481	349	15.54	83	22.52	51	10.43	69
27.7	57.469	283	37.28	65	11.218	291	35.04	77	20.830	345	14.71	28	23.03	51	9.74	6
Sept. 6.7	57.752	273	36.63	31	11.509	280	35.81	59	21.175	335	14.43	— 31	23.54	49	9.68	— 56
16.7	58.025	258	36.32	— 4	11.789	268	36.40	37	21.510	316	14.74	89	24.03	47	10.24	119
26.7	58.283	242	36.36	39	12.057	250	36.77	15	21.826	291	15.63	145	24.50	43	11.43	179
Oct. 6.6	58.525	222	36.75	72	12.307	231	36.92	— 5	22.117	261	17.08	195	24.93	37	13.22	232
16.6	58.747	197	37.47	100	12.538	209	36.87	25	22.378	224	19.03	238	25.30	32	15.54	277
26.6	58.944	171	38.47	125	12.747	185	36.62	41	22.602	183	21.41	274	25.62	23	18.31	313
Nov. 5.6	59.115	144	39.72	142	12.932	157	36.21	54	22.785	138	24.15	298	25.85	16	21.44	337
15.5	59.259	110	41.14	155	13.089	126	35.67	64	22.923	91	27.13	311	26.01	8	24.81	348
25.5	59.369	78	42.69	161	13.215	93	35.03	71	23.014	41	30.24	314	26.09	— 2	28.29	348
Dec. 5.5	59.447	41	44.30	160	13.308	57	34.32	72	23.055	— 11	33.38	304	26.07	9	31.77	335
15.4	59.488	4	45.90	154	13.365	18	33.60	73	23.044	61	36.42	286	25.98	18	35.12	310
25.4	59.492	— 34	47.44	143	13.383	— 21	32.87	69	22.983	110	39.28	256	25.80	26	38.22	276
35.4	59.458		48.87		13.362		32.18		22.873		41.84		25.54		40.98	
Mean Place	54.644		52.24		8.056		25.69		19.047		37.85		22.602		34.93	
Sec δ, Tan δ	1.008		−0.124		1.012		+0.153		1.356		−0.916		2.179		−1.935	
$D_\psi a$, $D_\omega a$	+0.06		0.00		+0.06		0.00		+0.04		+0.03		+0.02		+0.06	
$D_\psi \delta$, $D_\omega \delta$	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.2		+0.9	

Washington Mean Time.	γ Tauri. Mag. 3.9				δ Tauri. Mag. 3.9				υ^5 Eridani. Mag. 4.1				δ Mensæ. Mag. 5.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	4 15		+15 25		4 18		+17 21		4 20		−34 11		4 23		−80 23	
	s		″		s		″		s		″		s		″	
Jan. 0.4	13.227	38	60.73	36	18.038	35	14.85	27	61.707	99	83.42	228	29.63	100	88.78	246
10.4	13.189	76	60.37	38	18.003	75	14.58	29	61.608	137	85.70	192	28.63	118	91.24	199
20.3	13.113	111	59.99	37	17.928	111	14.29	30	61.471	175	87.62	152	27.45	131	93.23	147
30.3	13.002	139	59.62	38	17.817	140	13.99	34	61.296	204	89.14	109	26.14	141	94.70	89
Feb. 9.3	12.863	162	59.24	38	17.677	163	13.65	35	61.092	224	90.23	65	24.73	146	95.59	35
19.3	12.701	173	58.86	38	17.514	175	13.30	38	60.868	237	90.88	19	23.27	149	95.94	21
Mar. 1.2	12.528	175	58.48	37	17.339	178	12.92	39	60.631	237	91.07	27	21.78	147	95.73	75
11.2	12.353	165	58.11	35	17.161	169	12.53	38	60.394	229	90.80	70	20.31	141	94.98	127
21.2	12.188	150	57.76	31	16.992	150	12.15	36	60.165	209	90.10	113	18.90	133	93.71	175
31.2	12.038	118	57.45	23	16.842	122	11.79	31	59.956	181	88.97	152	17.57	119	91.96	217
Apr. 10.1	11.920	84	57.22	15	16.720	87	11.48	23	59.775	144	87.45	188	16.38	106	89.79	256
20.1	11.836	42	57.07	4	16.633	44	11.25	14	59.631	102	85.57	220	15.32	89	87.23	284
30.1	11.794	3	57.03	9	16.589	1	11.11	1	59.529	54	83.37	248	14.43	68	84.39	313
May 10.0	11.797	50	57.12	25	16.590	48	11.10	11	59.475	4	80.89	269	13.75	48	81.26	328
20.0	11.847	97	57.37	39	16.638	96	11.21	28	59.471	49	78.20	284	13.27	26	77.98	339
30.0	11.944	141	57.76	54	16.734	140	11.49	42	59.520	97	75.36	294	13.01	4	74.59	342
June 9.0	12.085	183	58.30	69	16.874	181	11.91	57	59.617	145	72.42	296	12.97	19	71.17	333
18.9	12.268	219	58.99	81	17.055	218	12.48	70	59.762	188	69.46	290	13.16	41	67.84	320
28.9	12.487	247	59.80	91	17.273	249	13.18	80	59.950	227	66.56	276	13.57	60	64.64	297
July 8.9	12.734	272	60.71	98	17.522	273	13.98	89	60.177	259	63.80	254	14.17	80	61.67	263
18.9	13.006	289	61.69	102	17.795	290	14.87	94	60.436	285	61.26	224	14.97	96	59.04	222
28.8	13.295	299	62.71	101	18.085	302	15.81	94	60.721	304	59.02	189	15.93	110	56.82	175
Aug. 7.8	13.594	307	63.72	98	18.387	308	16.75	93	61.025	316	57.13	145	17.03	120	55.07	122
17.8	13.901	304	64.70	91	18.695	308	17.68	88	61.341	320	55.68	96	18.23	127	53.85	64
27.7	14.205	299	65.61	80	19.003	302	18.56	78	61.661	318	54.72	44	19.50	129	53.21	0
Sept. 6.7	14.504	291	66.41	66	19.305	294	19.34	67	61.979	309	54.28	10	20.79	126	53.21	62
16.7	14.795	277	67.07	52	19.599	282	20.01	55	62.288	296	54.38	65	22.05	121	53.83	122
26.7	15.072	261	67.59	37	19.881	267	20.56	42	62.584	275	55.03	118	23.26	109	55.05	181
Oct. 6.6	15.333	243	67.96	21	20.148	247	20.98	27	62.859	250	56.21	166	24.35	96	56.86	233
16.6	15.576	220	68.17	7	20.395	227	21.25	16	63.109	220	57.87	209	25.31	76	59.19	277
26.6	15.796	196	68.24	5	20.622	200	21.41	4	63.329	187	59.96	243	26.07	57	61.96	314
Nov. 5.6	15.992	167	68.19	15	20.822	173	21.45	5	63.516	148	62.39	270	26.64	32	65.10	335
15.5	16.159	137	68.04	25	20.995	143	21.40	13	63.664	108	65.09	285	26.96	9	68.45	346
25.5	16.296	102	67.79	29	21.138	106	21.27	18	63.772	64	67.94	290	27.05	19	71.91	347
Dec. 5.5	16.398	65	67.50	33	21.244	69	21.09	21	63.836	20	70.84	285	26.86	42	75.38	329
15.4	16.463	25	67.17	35	21.313	29	20.88	23	63.856	27	73.69	270	26.44	66	78.67	307
25.4	16.488	16	66.82	36	21.342	13	20.65	26	63.829	73	76.39	245	25.78	87	81.74	269
35.4	16.472		66.46		21.329		20.39		63.756		78.84		24.91		84.43	
Mean Place	10.901		58.98		15.670		12.87		59.644		75.70		24.703		77.28	
Sec δ, Tan δ	1.037		+0.276		1.048		+0.313		1.209		−0.680		5.999		−5.915	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		−0.01		+0.07		−0.01		+0.04		+0.02		−0.08		+0.16	
$D_\psi \delta$, $D_\omega \delta$	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Tauri. Mag. 3.6				*m* Persei. Mag. 6.1				α Tauri. (*Aldebaran.*) Mag. 1.1				α Doradus. Mag. 3.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	4 23		+19 0		4 27		+42 53		4 31		+16 20		4 32		−55 12	
	s		″		s		″		s		″		s		″	
Jan. 0.4	55.502	31	8.69	19	45.760	47	37.61	104	18.633	25	52.15	33	17.063	195	53.88	269
10.4	55.471	71	8.50	21	45.713	99	38.65	84	18.608	66	51.82	32	16.868	252	56.57	226
20.4	55.400	109	8.29	25	45.614	147	39.49	61	18.542	103	51.50	33	16.616	301	58.83	179
30.3	55.291	139	8.04	28	45.467	187	40.10	36	18.439	135	51.17	33	16.315	341	60.62	126
Feb. 9.3	55.152	163	7.76	32	45.280	218	40.46	7	18.304	159	50.84	34	15.974	368	61.88	72
19.3	54.989	177	7.44	36	45.062	235	40.53	— 22	18.145	175	50.50	34	15.606	383	62.60	18
Mar. 1.2	54.812	181	7.08	38	44.827	239	40.31	49	17.970	179	50.16	35	15.223	385	62.78	— 38
11.2	54.631	173	6.70	40	44.588	230	39.82	77	17.791	173	49.81	33	14.838	373	62.40	90
21.2	54.458	154	6.30	39	44.358	206	39.05	99	17.618	156	49.48	31	14.465	349	61.50	139
31.2	54.304	126	5.91	37	44.152	171	38.06	117	17.462	130	49.17	24	14.116	312	60.11	186
Apr. 10.1	54.178	93	5.54	30	43.981	125	36.89	130	17.332	97	48.93	19	13.804	265	58.25	227
20.1	54.085	49	5.24	21	43.856	73	35.59	137	17.235	56	48.74	9	13.539	211	55.98	264
30.1	54.036	4	5.03	12	43.783	15	34.22	138	17.179	11	48.65	— 2	13.328	147	53.34	293
May 10.1	54.032	— 44	4.91	— 2	43.768	— 47	32.84	133	17.168	— 36	48.67	16	13.181	81	50.41	316
20.0	54.076	91	4.93	16	43.815	107	31.51	124	17.204	82	48.83	30	13.100	12	47.25	331
30.0	54.167	137	5.09	31	43.922	164	30.27	109	17.286	127	49.13	43	13.088	— 59	43.94	341
June 9.0	54.304	179	5.40	44	44.086	217	29.18	93	17.413	169	49.56	57	13.147	125	40.53	339
18.9	54.483	216	5.84	58	44.303	265	28.25	72	17.582	206	50.13	69	13.272	191	37.14	330
28.9	54.699	247	6.42	71	44.568	305	27.53	51	17.788	236	50.82	79	13.463	249	33.84	311
July 8.9	54.946	271	7.13	78	44.873	337	27.02	27	18.024	264	51.61	85	13.712	302	30.73	284
18.9	55.217	291	7.91	85	45.210	363	26.75	7	18.288	282	52.46	90	14.014	346	27.89	247
28.8	55.508	303	8.76	87	45.573	379	26.68	— 16	18.570	295	53.36	89	14.360	380	25.42	203
Aug. 7.8	55.811	310	9.63	86	45.952	390	26.84	35	18.865	304	54.25	87	14.740	406	23.39	152
17.8	56.121	310	10.49	83	46.342	393	27.19	54	19.169	305	55.12	80	15.146	421	21.87	96
27.8	56.431	306	11.32	76	46.735	390	27.73	71	19.474	302	55.92	70	15.567	425	20.91	35
Sept. 6.7	56.737	299	12.08	65	47.125	381	28.44	85	19.776	296	56.62	59	15.992	419	20.56	— 27
16.7	57.036	287	12.73	56	47.506	368	29.29	98	20.072	285	57.21	45	16.411	400	20.83	92
26.7	57.323	273	13.29	43	47.874	349	30.27	108	20.357	272	57.66	31	16.811	375	21.75	150
Oct. 6.6	57.596	253	13.72	32	48.223	628	31.35	118	20.629	255	57.97	16	17.186	337	23.25	206
16.6	57.849	234	14.04	20	48.551	300	32.53	126	20.884	235	58.13	4	17.523	292	25.31	255
26.6	58.083	208	14.24	10	48.851	271	33.79	131	21.119	211	58.17	— 8	17.815	239	27.86	295
Nov. 5.6	58.291	181	14.34	2	49.122	233	35.10	135	21.330	185	58.09	17	18.054	178	30.81	324
15.5	58.472	149	14.36	— 4	49.355	191	36.45	137	21.515	154	57.92	24	18.232	115	34.05	341
25.5	58.621	114	14.32	9	49.546	146	37.82	137	21.669	119	57.68	29	18.347	47	37.46	346
Dec. 5.5	58.735	76	14.23	13	49.692	93	39.19	133	21.788	81	57.39	31	18.394	— 21	40.92	339
15.5	58.811	34	14.10	15	49.785	40	40.52	126	21.869	40	57.08	32	18.373	92	44.31	321
25.4	58.845	— 7	13.95	17	49.825	— 15	41.78	113	21.909	— 1	56.76	32	18.281	157	47.52	291
35.4	58.838		13.78		49.810		42.91		21.908		56.44		18.124		50.43	
Mean Place	53.088		6.69		42.688		31.72		16.239		51.07		14.699		43.91	
Sec δ, Tan δ	1.058		+0.344		1.365		+0.929		1.042		+0.293		1.753		−1.439	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		−0.01		+0.08		−0.02		+0.07		−0.01		+0.03		+0.03	
$D_\psi \delta$, $D_\omega \delta$	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**ν Eridani.** Mag. 4.1				**53 Eridani.** Mag. 4.0				**τ Tauri.** Mag. 4.3				**Groombridge 848.** Mag. 6.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 4 32		° ′ − 3 30		h m 4 34		° ′ −14 27		h m 4 37		° ′ +22 48		h m 4 37		° ′ +75 47	
	s		″		s		″		s		″		s		″	
Jan. 0.4	18.397		64.05		30.256		45.66		25.417		11.33		62.25		54.55	
10.4	18.363	34	65.33	128	30.212	44	47.42	176	25.397	20	11.34	1	61.98	27	57.06	251
20.4	18.291	72	66.45	112	30.129	83	48.94	152	25.333	64	11.32	— 2	61.56	42	59.25	219
30.3	18.183	108	67.42	97	30.010	119	50.21	127	25.229	104	11.24	8	61.00	56	61.02	177
Feb. 9.3	18.047	136	68.20	78	29.861	149	51.21	100	25.092	137	11.10	14	60.33	67	62.31	129
19.3	17.887	160	68.79	59	29.689	172	51.90	69	24.927	165	10.88	22	59.58	75	63.08	77
Mar. 1.3	17.714	173	69.17	38	29.504	185	52.30	40	24.746	181	10.59	29	58.79	79	63.28	20
11.2	17.536	178	69.34	17	29.313	191	52.38	8	24.559	187	10.24	35	57.98	81	62.91	— 37
21.2	17.363	173	69.31	— 3	29.128	185	52.15	— 23	24.377	182	9.83	41	57.20	78	62.01	90
31.2	17.206	157	69.05	26	28.959	169	51.63	52	24.212	165	9.38	45	56.49	71	60.59	142
Apr. 10.1	17.072	134	68.59	46	28.812	147	50.80	83	24.073	139	8.91	47	55.87	62	58.74	185
20.1	16.971	101	67.91	68	28.698	114	49.70	110	23.968	105	8.47	44	55.38	49	56.52	222
30.1	16.907	64	67.03	88	28.622	76	48.34	136	23.907	61	8.07	40	55.03	35	54.03	249
May 10.1	16.885	22	65.94	109	28.588	34	46.73	161	23.891	16	7.75	32	54.84	19	51.35	268
20.0	16.908	— 23	64.67	127	28.598	— 10	44.92	181	23.923	— 32	7.54	21	54.82	2	48.59	276
30.0	16.975	67	63.24	143	28.653	55	42.94	198	24.003	80	7.44	10	54.96	— 14	45.82	277
June 9.0	17.085	110	61.68	156	28.752	99	40.83	211	24.131	128	7.47	— 3	55.27	31	43.14	268
19.0	17.235	150	60.01	167	28.892	140	38.65	218	24.301	170	7.65	18	55.74	47	40.62	252
28.9	17.420	185	58.30	171	29.070	178	36.44	221	24.511	210	7.96	31	56.34	60	38.34	228
July 8.9	17.637	217	56.58	172	29.281	211	34.27	217	24.753	242	8.39	43	57.07	73	36.35	199
18.9	17.879	242	54.90	168	29.519	238	32.23	204	25.023	270	8.93	54	57.90	83	34.70	165
28.8	18.142	263	53.34	156	29.779	260	30.34	189	25.313	290	9.55	62	58.82	92	33.42	128
Aug. 7.8	18.419	277	51.92	142	30.053	274	28.70	164	25.619	306	10.22	67	59.82	100	32.53	89
17.8	18.702	283	50.72	120	30.338	285	27.34	136	25.932	313	10.92	70	60.86	104	32.05	48
27.8	18.989	287	49.75	97	30.627	289	26.33	101	26.250	318	11.61	69	61.93	107	31.99	6
Sept. 6.7	19.275	286	49.08	67	30.915	288	25.70	63	26.565	315	12.28	67	63.01	108	32.35	— 36
16.7	19.554	279	48.72	36	31.197	282	25.48	22	26.875	310	12.89	61	64.08	107	33.12	77
26.7	19.823	269	48.68	4	31.469	272	25.68	— 20	27.174	299	13.43	54	65.11	103	34.29	117
Oct. 6.7	20.077	254	48.97	— 29	31.726	257	26.28	60	27.461	287	13.90	47	66.10	99	35.84	155
16.6	20.316	239	49.57	60	31.966	240	27.28	100	27.731	270	14.28	38	67.02	92	37.72	188
26.6	20.533	217	50.44	87	32.184	218	28.62	134	27.981	250	14.58	30	67.86	84	39.93	221
Nov. 5.6	20.728	195	51.55	111	32.376	192	30.26	164	28.208	227	14.81	23	68.60	74	42.42	249
15.5	20.896	168	52.84	129	32.541	165	32.11	185	28.406	198	14.99	18	69.22	62	45.12	270
25.5	21.034	138	54.26	142	32.673	132	34.12	201	28.573	167	15.12	13	69.70	48	47.98	286
Dec. 5.5	21.138	104	55.74	148	32.771	98	36.21	209	28.705	132	15.23	11	70.03	33	50.92	294
15.5	21.205	67	57.23	149	32.830	59	38.29	208	28.798	93	15.32	9	70.20	17	53.88	296
25.4	21.233	28	58.68	145	32.849	19	40.29	200	28.847	49	15.38	6	70.19	— 1	56.75	287
35.4	21.221	— 12	60.03	135	32.827	— 22	42.16	187	28.851	4	15.41	3	70.03	16	59.44	269
Mean Place	16.223		61.44		28.138		41.10		22.890		9.45		54.413		45.95	
Sec δ, Tan δ	1.002		−0.061		1.033		−0.258		1.085		+0.420		4.076		+3.951	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.06		0.00		+0.05		+0.01		+0.07		−0.01		+0.16		−0.09	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		+0.9		+0.1		+0.9		+0.1		+0.9		+0.1		+0.9	

Washington Mean Time.	α Cœli. Mag. 4.5				4 Camelop. Mag. 5.4				μ Eridani. Mag. 4.2				π^3 Orionis. Mag. 3.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 4 37 s		° ′ −42 0 ″		h m 4 41 s		° ′ +56 36 ″		h m 4 41 s		° ′ − 3 23 ″		h m 4 45 s		° ′ + 6 49 ″	
Jan. 0.4	59.164		73.96		18.944		60.07		29.289		70.49		28.799		14.35	
10.4	59.053	111	76.54	258	18.880	64	61.82	175	29.263	26	71.80	131	28.784	15	13.52	83
20.4	58.896	157	78.75	221	18.743	137	63.32	150	29.197	66	72.95	115	28.728	56	12.78	74
30.3	58.696	200	80.54	179	18.540	203	64.52	120	29.095	102	73.94	99	28.635	93	12.14	64
Feb. 9.3	58.461	235	81.86	132	18.282	258	65.36	84	28.963	132	74.74	80	28.508	127	11.58	56
19.3	58.201	260	82.69	83	17.982	300	65.82	46	28.805	158	75.34	60	28.357	151	11.11	47
Mar. 1.3	57.926	275	83.01	32 —	17.656	326	65.85	3 —	28.632	173	75.75	41	28.188	169	10.75	36
11.2	57.647	279	82.85	16	17.322	334	65.47	38	28.454	178	75.94	19 —	28.012	176	10.50	25
21.2	57.375	272	82.20	65	16.998	324	64.69	78	28.278	176	75.93	1	27.840	172	10.35	15
31.2	57.121	254	81.08	112	16.702	296	63.55	114	28.118	160	75.70	23	27.682	158	10.32	3 —
Apr. 10.1	56.895	226	79.53	155	16.449	253	62.11	144	27.979	139	75.26	44	27.545	137	10.41	9
20.1	56.705	190	77.60	193	16.252	197	60.41	170	27.871	108	74.61	65	27.440	105	10.64	23
30.1	56.561	144	75.30	230	16.123	129	58.53	188	27.800	71	73.76	85	27.372	68	11.01	37
May 10.1	56.467	94	72.69	261	16.068	55 —	56.55	198	27.770	30 —	72.71	105	27.346	26 —	11.53	52
20.0	56.426	41 —	69.85	284	16.090	22	54.54	201	27.784	14	71.47	124	27.365	19	12.21	68
30.0	56.440	14	66.82	303	16.191	101	52.57	197	27.842	58	70.08	139	27.428	63	13.03	82
June 9.0	56.509	69	63.70	312	16.367	176	50.70	187	27.944	102	68.55	153	27.535	107	13.98	95
19.0	56.631	122	60.55	315	16.614	247	48.99	171	28.085	141	66.92	163	27.682	147	15.04	106
28.9	56.803	172	57.46	309	16.925	311	47.48	151	28.264	179	65.25	167	27.865	183	16.19	115
July 8.9	57.020	217	54.50	296	17.292	367	46.22	126	28.475	211	63.54	171	28.082	217	17.39	120
18.9	57.276	256	51.76	274	17.705	413	45.22	100	28.712	237	61.90	164	28.324	242	18.61	122
28.8	57.564	288	49.34	242	18.156	451	44.51	71	28.970	258	60.34	156	28.588	264	19.78	117
Aug. 7.8	57.878	314	47.31	203	18.634	478	44.09	42	29.242	272	58.94	140	28.866	278	20.90	112
17.8	58.209	331	45.73	158	19.131	497	43.97	12 —	29.524	282	57.74	120	29.153	287	21.90	100
27.8	58.551	342	44.67	106	19.637	506	44.15	18	29.810	286	56.79	95	29.445	292	22.75	85
Sept. 6.7	58.895	344	44.16	51 —	20.145	508	44.60	45	30.096	286	56.12	67	29.737	292	23.40	65
16.7	59.234	339	44.24	8	20.647	502	45.33	73	30.376	280	55.77	35	30.024	287	23.85	45
26.7	59.561	327	44.91	67	21.134	487	46.30	97	30.648	272	55.73	4 —	30.303	279	24.06	21 —
Oct. 6.7	59.868	307	46.15	124	21.602	468	47.51	121	30.908	260	56.02	29	30.571	268	24.04	2
16.6	60.151	283	47.92	177	22.042	440	48.96	145	31.151	243	56.63	61	30.823	252	23.79	25
26.6	60.400	249	50.17	225	22.449	407	50.60	164	31.376	225	57.50	87	31.058	235	23.34	45
Nov. 5.6	60.613	213	52.82	265	22.814	365	52.39	179	31.578	202	58.63	113	31.271	213	22.72	62
15.5	60.785	172	55.75	293	23.131	317	54.32	193	31.753	175	59.94	131	31.460	189	21.95	77
25.5	60.909	124	58.89	314	23.392	261	56.35	203	31.900	147	61.37	143	31.618	158	21.09	86
Dec. 5.5	60.984	75	62.09	320	23.590	198	58.43	208	32.015	115	62.88	151	31.744	126	20.18	91
15.5	61.007	23 —	65.25	316	23.717	127	60.51	208	32.090	75	64.39	151	31.834	90	19.25	93
25.4	60.978	29	68.26	301	23.771	54 —	62.52	201	32.125	35 —	65.86	147	31.883	49	18.34	91
35.4	60.897	81	71.04	278	23.749	22	64.39	187	32.123	2	67.24	138	31.891	8	17.48	86
Mean Place	56.985		65.45		14.985		53.56		27.089		67.64		26.492		15.62	
Sec δ, Tan δ	1.346		−0.901		1.817		+1.517		1.002		−0.059		1.007		+0.120	
$D_\psi\alpha$, $D_\omega\alpha$	+0.04		+0.02		+0.10		−0.03		+0.06		0.00		+0.06		0.00	
$D_\psi\delta$, $D_\omega\delta$	+0.1		+0.9		+0.1		+0.9		+0.1		+0.9		+0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	9 Camelop. Mag. 4.4				*i* Tauri. Mag. 5.1				π^5 Orionis. Mag. 3.9				ι Aurigæ. Mag. 2.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 4 45		° ′ +66 12		h m 4 46		° ′ +18 42		h m 4 50		° ′ + 2 18		h m 4 51		° ′ +33 2	
	s		″		s		″		s		″		s		″	
Jan. 0.4	64.49		32.02		40.506		11.80		4.150		30.70		45.778		23.12	
10.4	64.38	11	34.21	219	40.493	13	11.59	21	4.135	15	29.65	105	45.768	10	23.70	58
20.4	64.18	20	36.14	193	40.438	55	11.37	22	4.079	56	28.70	95	45.708	60	24.19	49
30.3	63.88	30	37.70	156	40.342	96	11.16	21	3.985	94	27.87	83	45.601	107	24.56	37
Feb. 9.3	63.51	37	38.85	115	40.211	131	10.93	23	3.858	127	27.20	67	45.455	146	24.78	22
19.3	63.09	42	39.54	69	40.055	156	10.69	24	3.707	151	26.66	54	45.277	178	24.84	6
Mar. 1.3	62.63	46	39.75	21	39.881	174	10.39	30	3.536	171	26.26	40	45.078	199	24.73	11
11.2	62.15	48	39.45	30	39.698	183	10.09	30	3.359	177	26.02	24	44.870	208	24.43	30
21.2	61.69	46	38.68	77	39.517	181	9.77	32	3.184	175	25.93	9	44.664	206	23.96	47
31.2	61.27	42	37.46	122	39.353	164	9.45	32	3.023	161	26.00	7	44.474	190	23.35	61
Apr. 10.2	60.90	37	35.85	161	39.212	141	9.15	30	2.882	141	26.24	24	44.312	162	22.62	73
20.1	60.61	29	33.93	192	39.103	109	8.89	26	2.772	110	26.64	40	44.186	126	21.81	81
30.1	60.40	21	31.76	217	39.036	67	8.70	19	2.698	74	27.21	57	44.104	82	20.96	85
May 10.1	60.30	10	29.43	233	39.010	26	8.61	9	2.665	33	27.96	75	44.070	34	20.12	84
20.0	60.29	1	27.03	240	39.032	22	8.62	1	2.676	11	28.87	91	44.089	19	19.32	80
30.0	60.39	10	24.62	241	39.101	69	8.75	13	2.731	55	29.93	106	44.161	72	18.60	72
June 9.0	60.59	20	22.30	232	39.216	115	8.98	23	2.830	99	31.13	120	44.284	123	17.99	61
19.0	60.89	30	20.13	217	39.372	156	9.37	39	2.967	137	32.43	130	44.455	171	17.51	48
28.9	61.28	39	18.16	197	39.568	196	9.87	50	3.143	176	33.80	137	44.669	214	17.17	34
July 8.9	61.74	46	16.46	170	39.795	227	10.45	58	3.351	208	35.21	141	44.921	252	17.00	17
18.9	62.27	53	15.03	143	40.050	255	11.13	68	3.584	233	36.60	139	45.204	283	16.96	4
28.9	62.85	58	13.95	108	40.328	278	11.86	73	3.841	257	37.94	134	45.512	308	17.06	10
Aug. 7.8	63.48	63	13.20	75	40.620	292	12.59	73	4.112	271	39.16	122	45.838	326	17.29	23
17.8	64.13	65	12.79	41	40.923	303	13.32	73	4.393	281	40.25	109	46.176	338	17.63	34
27.8	64.80	67	12.76	3	41.230	307	14.00	68	4.680	287	41.14	89	46.520	344	18.06	43
Sept. 6.7	65.47	67	13.08	32	41.537	307	14.62	62	4.967	287	41.78	64	46.866	346	18.55	49
16.7	66.14	67	13.74	66	41.841	304	15.13	51	5.252	285	42.18	40	47.208	342	19.10	55
26.7	66.80	66	14.73	99	42.138	297	15.55	42	5.529	277	42.30	12	47.542	334	19.68	58
Oct. 6.7	67.43	63	16.05	132	42.420	282	15.84	29	5.795	266	42.14	16	47.865	323	20.29	61
16.6	68.02	59	17.66	161	42.689	269	16.02	18	6.045	250	41.73	41	48.171	306	20.91	62
26.6	68.57	55	19.53	187	42.940	251	16.08	6	6.279	234	41.07	66	48.458	286	21.55	64
Nov. 5.6	69.06	49	21.63	210	43.168	228	16.06	2	6.492	213	40.21	86	48.720	262	22.21	66
15.5	69.48	42	23.93	230	43.370	202	15.96	10	6.680	188	39.19	102	48.954	234	22.88	67
25.5	69.81	33	26.38	245	43.543	173	15.80	16	6.838	158	38.05	114	49.153	199	23.57	69
Dec. 5.5	70.07	26	28.90	252	43.680	137	15.63	17	6.964	126	36.85	120	49.313	160	24.26	69
15.5	70.23	16	31.45	255	43.778	98	15.44	19	7.052	88	35.64	121	49.429	116	24.95	69
25.4	70.28	5	33.93	248	43.835	57	15.24	20	7.103	51	34.47	117	49.496	67	25.62	67
35.4	70.24	4	36.26	233	43.849	14	15.02	22	7.111	8	33.36	111	49.514	18	26.24	62
Mean Place	59.338		25.02		38.026		11.17		1.877		32.88		42.964		20.63	
Sec δ, Tan δ	2.479		+2.268		1.056		+0.339		1.001		+0.040		1.193		+0.650	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.12		−0.05		+0.07		−0.01		+0.06		0.00		+0.08		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		+0.9		+0.1		+0.9		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Aurigæ. Var. 3.0–4.5				β Camelop. Mag. 4.2				ζ Aurigæ. Mag. 3.9				ι Tauri. Mag. 4.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 4 56		° ′ +43 42		h m 4 56		° ′ +60 19		h m 4 56		° ′ +40 57		h m 4 58		° ′ +21 28	
	s		″		s		″		s		″		s		″	
Jan. 0.4	12.435	14	20.69	115	16.72	5	37.50	199	51.878	11	35.48	101	17.735	1	31.39	6
10.4	12.421	73	21.84	102	16.67	14	39.49	175	51.867	66	36.49	89	17.734	47	31.33	6
20.4	12.348	127	22.86	82	16.53	21	41.24	145	51.801	118	37.38	71	17.687	89	31.27	8
30.3	12.221	173	23.68	59	16.32	28	42.69	110	51.683	164	38.09	51	17.598	127	31.19	12
Feb. 9.3	12.048	211	24.27	32	16.04	34	43.79	69	51.519	199	38.60	26	17.471	157	31.07	16
19.3	11.837	235	24.59	5	15.70	36	44.48	25	51.320	223	38.86	2	17.314	176	30.91	22
Mar. 1.3	11.602	246	24.64	25	15.34	38	44.73	20	51.097	234	38.88	25	17.138	187	30.69	26
11.2	11.356	244	24.39	52	14.96	37	44.53	62	50.863	232	38.63	49	16.951	185	30.43	31
21.2	11.112	226	23.87	79	14.59	35	43.91	104	50.631	215	38.14	73	16.766	172	30.12	35
31.2	10.886	195	23.08	100	14.24	29	42.87	138	50.416	187	37.41	92	16.594	150	29.77	35
Apr. 10.2	10.691	155	22.08	117	13.95	25	41.49	169	50.229	147	36.49	107	16.444	118	29.42	35
20.1	10.536	104	20.91	129	13.70	17	39.80	191	50.082	100	35.42	118	16.326	79	29.07	31
30.1	10.432	48	19.62	136	13.53	10	37.89	208	49.982	45	34.24	122	16.247	35	28.76	23
May 10.1	10.384	11	18.26	136	13.43	1	35.81	215	49.937	12	33.02	122	16.212	12	28.53	17
20.0	10.395	71	16.90	132	13.42	9	33.66	215	49.949	69	31.80	117	16.224	60	28.36	6
30.0	10.466	130	15.58	123	13.51	16	31.51	207	50.018	126	30.63	108	16.284	106	28.30	6
June 9.0	10.596	187	14.35	110	13.67	23	29.44	197	50.144	179	29.55	96	16.390	149	28.36	17
19.0	10.783	235	13.25	94	13.90	31	27.47	178	50.323	227	28.59	80	16.539	188	28.53	29
28.9	11.018	279	12.31	76	14.21	38	25.69	155	50.550	270	27.79	63	16.727	224	28.82	39
July 8.9	11.297	317	11.55	58	14.59	43	24.14	129	50.820	305	27.16	45	16.951	252	29.21	47
18.9	11.614	347	10.97	37	15.02	48	22.85	102	51.125	333	26.71	26	17.203	275	29.68	54
28.9	11.961	368	10.60	17	15.50	51	21.83	71	51.458	356	26.45	9	17.478	293	30.22	58
Aug. 7.8	12.329	384	10.43	1	16.01	54	21.12	41	51.814	369	26.36	9	17.771	305	30.80	58
17.8	12.713	393	10.44	20	16.55	55	20.71	9	52.183	378	26.45	24	18.076	310	31.38	57
27.8	13.106	396	10.64	36	17.10	56	20.62	22	52.561	380	26.69	38	18.386	313	31.95	52
Sept. 6.7	13.502	394	11.00	52	17.66	56	20.84	51	52.941	377	27.07	51	18.699	310	32.47	45
16.7	13.896	385	11.52	67	18.22	54	21.35	81	53.318	370	27.58	63	19.009	303	32.92	37
26.7	14.281	373	12.19	79	18.76	53	22.16	109	53.688	358	28.21	74	19.312	294	33.29	29
Oct. 6.7	14.654	354	12.98	91	19.29	50	23.25	135	54.046	341	28.95	82	19.606	280	33.58	19
16.6	15.008	333	13.89	102	19.79	47	24.60	158	54.387	320	29.77	91	19.886	263	33.77	11
26.6	15.341	305	14.91	112	20.26	43	26.18	179	54.707	293	30.68	98	20.149	243	33.88	5
Nov. 5.6	15.646	271	16.03	121	20.69	37	27.97	198	55.000	261	31.66	105	20.392	217	33.93	0
15.6	15.917	231	17.24	127	21.06	31	29.95	212	55.261	223	32.71	112	20.609	187	33.93	4
25.5	16.148	184	18.51	131	21.37	24	32.07	220	55.484	180	33.83	114	20.796	152	33.89	5
Dec. 5.5	16.332	133	19.82	132	21.61	17	34.27	224	55.664	131	34.97	115	20.948	113	33.84	5
15.5	16.465	78	21.14	130	21.78	7	36.51	221	55.795	77	36.12	114	21.061	69	33.79	5
25.4	16.543	18	22.44	122	21.85	1	38.72	208	55.872	21	37.26	108	21.130	25	33.74	5
35.4	16.561		23.66		21.84		40.80		55.893		38.34		21.155		33.69	
Mean Place	9.224		17.12		12.329		32.10		48.782		32.32		15.176		31.02	
Sec δ, Tan δ	1.383		+0.956		2.020		+1.755		1.324		+0.868		1.075		+0.393	
$D_\psi a$, $D_\omega a$	+0.09		−0.02		+0.11		−0.03		+0.08		−0.02		+0.07		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	11 Orionis. Mag. 4.6				η Aurigæ. Mag. 3.3				ε Leporis. Mag. 3.3				β Eridani. Mag. 2.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 4 59		° ′ +15 17		h m 5 0		° ′ +41 7		h m 5 2		° ′ −22 28		h m 5 3		° ′ − 5 11	
	s		″		s		″		s		″		s		″	
Jan. 0.4	58.812		31.99		53.051		37.24		4.072		50.24		54.293		28.15	
10.4	58.813	1	31.59	40	53.044	7	38.27	103	4.037	35	52.44	220	54.283	10	29.61	146
20.4	58.769	44	31.23	36	52.981	63	39.18	91	3.959	78	54.40	196	54.231	52	30.93	132
30.4	58.683	86	30.90	33	52.866	115	39.94	76	3.841	118	56.04	164	54.141	90	32.04	111
Feb. 9.3	58.561	122	30.59	31	52.704	162	40.48	54	3.688	153	57.35	131	54.015	126	32.96	92
19.3	58.411	150	30.30	29	52.506	198	40.78	30	3.509	179	58.31	96	53.863	152	33.66	70
Mar. 1.3	58.239	172	30.03	27	52.283	223	40.83	5	3.310	199	58.89	58	53.690	173	34.14	48
11.2	58.058	181	29.77	26	52.048	235	40.61	22	3.102	208	59.09	20	53.508	182	34.39	25
21.2	57.878	180	29.53	24	51.815	233	40.14	47	2.895	207	58.91	18	53.326	182	34.41	2
31.2	57.711	167	29.33	20	51.598	217	39.44	70	2.700	195	58.37	54	53.155	171	34.20	21
Apr. 10.2	57.565	146	29.17	16	51.407	191	38.54	90	2.525	175	57.49	88	53.003	152	33.79	41
20.1	57.449	116	29.06	11	51.256	151	37.49	105	2.378	147	56.26	123	52.880	123	33.13	66
30.1	57.370	79	29.03	3	51.153	103	36.32	117	2.268	110	54.73	153	52.791	89	32.27	86
May 10.1	57.334	36	29.10	7	51.104	49	35.09	123	2.198	70	52.93	180	52.741	50	31.21	106
20.1	57.342	8	29.29	19	51.110	6	33.87	122	2.173	25	50.87	206	52.734	7	29.94	127
30.0	57.396	54	29.58	29	51.175	65	32.69	118	2.193	20	48.63	224	52.771	37	28.52	142
June 9.0	57.495	99	29.99	41	51.296	121	31.59	110	2.259	66	46.24	239	52.850	79	26.97	155
19.0	57.636	141	30.52	53	51.471	175	30.61	98	2.368	109	43.77	247	52.970	120	25.30	167
28.9	57.816	180	31.15	63	51.694	223	29.77	84	2.518	150	41.28	249	53.128	158	23.59	171
July 8.9	58.029	213	31.86	71	51.960	266	29.11	66	2.704	186	38.83	245	53.318	190	21.87	172
18.9	58.270	241	32.62	76	52.262	302	28.62	49	2.922	218	36.50	233	53.539	221	20.18	169
28.9	58.535	265	33.41	79	52.593	331	28.31	31	3.166	244	34.37	213	53.781	242	18.61	157
Aug. 7.8	58.816	281	34.19	78	52.946	353	28.17	14	3.431	265	32.51	186	54.042	261	17.19	142
17.8	59.108	292	34.93	74	53.315	369	28.20	3	3.711	280	30.98	153	54.315	273	15.99	120
27.8	59.406	298	35.58	65	53.692	377	28.40	20	4.002	291	29.84	114	54.596	281	15.03	96
Sept. 6.8	59.707	301	36.14	56	54.073	381	28.73	33	4.296	294	29.13	71	54.880	284	14.37	66
16.7	60.005	298	36.57	43	54.453	380	29.19	46	4.589	293	28.88	25	55.163	283	14.04	33
26.7	60.298	293	36.85	28	54.825	372	29.77	58	4.877	288	29.12	24	55.441	278	14.04	0
Oct. 6.7	60.581	283	36.97	12	55.186	361	30.47	70	5.154	277	29.84	72	55.710	269	14.40	36
16.6	60.851	270	36.96	1	55.531	345	31.25	78	5.416	262	31.02	118	55.965	255	15.08	68
26.6	61.105	254	36.81	15	55.856	325	32.13	88	5.659	243	32.61	159	56.205	240	16.06	98
Nov. 5.6	61.339	234	36.54	27	56.155	299	33.08	95	5.877	218	34.56	195	56.424	219	17.30	124
15.6	61.547	208	36.19	35	56.421	266	34.12	104	6.067	190	36.79	223	56.619	195	18.75	145
25.5	61.728	181	35.77	42	56.650	229	35.21	109	6.224	157	39.21	242	56.785	166	20.34	159
Dec. 5.5	61.875	147	35.33	44	56.835	185	36.35	114	6.343	119	41.75	254	56.917	132	22.01	167
15.5	61.984	109	34.88	45	56.972	137	37.51	116	6.422	79	44.30	255	57.014	97	23.70	169
25.5	62.052	68	34.44	44	57.054	82	38.65	114	6.458	36	46.78	248	57.070	56	25.33	163
35.4	62.076	24	34.03	41	57.080	26	39.74	109	6.449	9	49.10	232	57.084	14	26.88	155
Mean Place	56.357		32.63		49.935		34.42		1.889		44.32		52.046		24.44	
Sec δ, Tan δ	1.037		+0.273		1.328		+0.873		1.082		−0.414		1.004		−0.091	
$D_\psi\alpha$, $D_\omega\alpha$	+0.07		0.00		+0.08		−0.02		+0.05		+0.01		+0.06		0.00	
$D_\psi\delta$, $D_\omega\delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Aurigæ. Mag. 4.8				19 H. Camelop. Mag. 5.2				μ Leporis. Mag. 3.3				β Orionis. (*Rigel.*) Mag. 0.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 7		+38 23		5 9		+79 8		5 9		−16 17		5 10		− 8 17	
	s		″		s		″		s		″		s		″	
Jan. 0.4	55.975	5	25.31	89	21.15	23	33.72	279	19.757	18	66.94	199	40.900	7	43.53	164
10.4	55.980	53	26.20	80	20.92	44	36.51	253	19.739	61	68.93	178	40.893	49	45.17	147
20.4	55.927	103	27.00	66	20.48	65	39.04	216	19.678	101	70.71	151	40.844	90	46.64	125
30.4	55.824	149	27.66	49	19.83	81	41.20	173	19.577	136	72.22	122	40.754	125	47.89	103
Feb. 9.3	55.675	186	28.15	29	19.02	94	42.93	122	19.441	166	73.44	91	40.629	154	48.92	77
19.3	55.489	212	28.44	7	18.08	103	44.15	66	19.275	184	74.35	59	40.475	174	49.69	53
Mar. 1.3	55.277	225	28.51	17	17.05	108	44.81	8	19.091	196	74.94	25	40.301	185	50.22	27
11.2	55.052	225	28.34	39	15.97	106	44.89	50	18.895	196	75.19	7	40.116	185	50.49	2
21.2	54.827	210	27.95	60	14.91	101	44.39	104	18.699	186	75.12	37	39.931	177	50.51	25
31.2	54.617	187	27.35	79	13.90	91	43.35	155	18.513	167	74.75	70	39.754	157	50.26	48
Apr. 10.2	54.430	149	26.56	92	12.99	77	41.80	198	18.346	140	74.05	99	39.597	129	49.78	74
20.1	54.281	105	25.64	102	12.22	59	39.82	233	18.206	105	73.06	128	39.468	97	49.04	96
30.1	54.176	54	24.62	107	11.63	42	37.49	260	18.101	66	71.78	153	39.371	58	48.08	119
May 10.1	54.122	1	23.55	108	11.21	19	34.89	278	18.035	23	70.25	175	39.313	15	46.89	139
20.1	54.123	55	22.47	103	11.02	0	32.11	287	18.012	21	68.50	194	39.298	28	45.50	156
30.0	54.178	110	21.44	97	11.02	23	29.24	286	18.033	64	66.56	210	39.326	71	43.94	170
June 9.0	54.288	161	20.47	85	11.25	42	26.38	278	18.097	107	64.46	219	39.397	111	42.24	180
19.0	54.449	209	19.62	72	11.67	63	23.60	260	18.204	147	62.27	222	39.508	150	40.44	185
28.9	54.658	251	18.90	57	12.30	80	21.00	239	18.351	181	60.05	220	39.658	184	38.59	186
July 8.9	54.909	285	18.33	42	13.10	95	18.61	209	18.532	212	57.85	210	39.842	213	36.73	180
18.9	55.194	314	17.91	25	14.05	109	16.52	176	18.744	238	55.75	196	40.055	237	34.93	167
28.9	55.508	337	17.66	11	15.14	120	14.76	141	18.982	258	53.79	172	40.292	257	33.26	151
Aug. 7.8	55.845	353	17.55	3	16.34	129	13.35	100	19.240	273	52.07	145	40.549	270	31.75	128
17.8	56.198	362	17.58	16	17.63	134	12.35	58	19.513	282	50.62	111	40.819	279	30.47	102
27.8	56.560	367	17.74	29	18.97	139	11.77	16	19.795	288	49.51	72	41.098	284	29.45	66
Sept. 6.8	56.927	366	18.03	39	20.36	140	11.61	26	20.083	287	48.79	30	41.382	283	28.79	32
16.7	57.293	361	18.42	47	21.76	137	11.87	69	20.370	283	48.49	14	41.665	280	28.47	3
26.7	57.654	350	18.89	56	23.13	135	12.56	111	20.653	274	48.63	57	41.945	271	28.50	42
Oct. 6.7	58.004	336	19.45	64	24.48	127	13.67	151	20.927	260	49.20	100	42.216	259	28.92	77
16.6	58.340	319	20.09	71	25.75	119	15.18	187	21.187	244	50.20	137	42.475	244	29.69	109
26.6	58.659	294	20.80	78	26.94	106	17.05	222	21.431	222	51.57	171	42.719	224	30.78	139
Nov. 5.6	58.953	265	21.58	84	28.00	93	19.27	252	21.653	196	53.28	196	42.943	199	32.17	161
15.6	59.218	229	22.42	90	28.93	75	21.79	275	21.849	166	55.24	217	43.142	170	33.78	176
25.5	59.447	189	23.32	94	29.68	56	24.54	293	22.015	131	57.41	226	43.312	138	35.54	185
Dec. 5.5	59.636	141	24.26	97	30.24	36	27.47	301	22.146	93	59.67	228	43.450	101	37.39	188
15.5	59.777	89	25.23	98	30.60	12	30.48	302	22.239	50	61.95	223	43.551	60	39.27	183
25.5	59.866	35	26.21	94	30.72	10	33.50	291	22.289	7	64.18	211	43.611	17	41.10	173
35.4	59.901		27.15		30.62		36.41		22.296		66.29		43.628		42.83	
Mean Place	52.945		23.39		10.862		28.38		17.549		61.71		38.656		39.27	
Sec δ, Tan δ	1.276		+0.792		5.308		+5.213		1.042		−0.292		1.011		−0.146	
Dψa, Dωa	+0.08		−0.01		+0.20		−0.08		+0.05		0.00		+0.06		0.00	
	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Aurigæ. (*Capella.*) Mag. 0.2				λ Aurigæ. Mag. 4.8				τ Orionis. Mag. 3.7				o Columbæ. Mag. 4.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 10		+45 54		5 13		+40 1		5 13		− 6 55		5 14		−34 58	
	s		″		s		″		s		″		s		″	
Jan. 0.4	45.522		63.90		29.559		44.03		42.633		55.58		35.862		33.30	
10.4	45.523	1	65.20	130	29.570	11	45.00	97	42.630	3	57.16	158	35.812	50	36.00	270
20.4	45.462	— 61	66.36	116	29.523	— 47	45.88	88	42.585	45	58.59	143	35.713	99	38.40	240
30.4	45.342	120	67.35	99	29.423	100	46.62	75	42.499	86	59.80	121	35.570	143	40.45	205
Feb. 9.3	45.171	171	68.10	75	29.275	148	47.19	57	42.377	122	60.80	100	35.387	183	42.08	163
19.3	44.958	213	68.60	50	29.089	186	47.55	36	42.226	151	61.56	76	35.173	214	43.29	121
Mar. 1.3	44.717	241	68.78	18	28.874	215	47.67	12	42.054	172	62.08	52	34.938	235	44.04	75
11.3	44.459	258	68.66	— 12	28.645	229	47.54	— 13	41.871	183	62.36	28	34.691	247	44.33	29
21.2	44.203	256	68.25	41	28.415	230	47.17	37	41.686	185	62.40	4	34.442	249	44.16	— 17
31.2	43.960	243	67.55	70	28.198	217	46.58	59	41.510	176	62.19	— 21	34.204	238	43.55	61
Apr. 10.2	43.746	214	66.60	95	28.004	194	45.77	81	41.353	157	61.75	44	33.986	218	42.51	104
20.1	43.571	175	65.43	117	27.847	157	44.81	96	41.223	130	61.06	69	33.797	189	41.08	143
30.1	43.446	125	64.12	131	27.735	112	43.74	107	41.125	98	60.16	90	33.645	152	39.26	182
May 10.1	43.377	69	62.70	142	27.674	61	42.59	115	41.066	59	59.04	112	33.536	109	37.12	214
20.1	43.368	9	61.23	147	27.668	6	41.42	117	41.049	17	57.74	130	33.474	62	34.71	241
30.0	43.422	— 54	59.78	145	27.720	— 52	40.27	115	41.075	— 26	56.26	148	33.462	12	32.07	264
June 9.0	43.536	114	58.38	140	27.826	106	39.19	108	41.144	69	54.64	162	33.499	— 37	29.28	279
19.0	43.708	172	57.09	129	27.985	159	38.21	98	41.254	110	52.93	171	33.584	85	26.39	289
29.0	43.933	225	55.94	115	28.192	207	37.35	86	41.403	149	51.14	179	33.716	132	23.49	290
July 8.9	44.205	272	54.94	100	28.443	251	36.64	71	41.584	181	49.35	179	33.890	174	20.65	284
18.9	44.518	313	54.13	81	28.730	287	36.08	56	41.797	213	47.61	174	34.104	214	17.96	269
28.9	44.865	347	53.52	61	29.048	318	35.69	39	42.032	235	45.99	162	34.350	246	15.51	245
Aug. 7.8	45.236	371	53.10	42	29.390	342	35.46	23	42.288	256	44.52	147	34.622	272	13.38	213
17.8	45.626	390	52.89	21	29.749	359	35.37	9	42.557	269	43.28	124	34.915	293	11.62	176
27.8	46.030	404	52.86	3	30.118	369	35.43	— 6	42.836	279	42.29	99	35.224	309	10.32	130
Sept. 6.8	46.439	409	53.02	— 16	30.493	375	35.63	20	43.119	283	41.62	67	35.541	317	9.53	79
16.7	46.848	409	53.35	33	30.869	376	35.93	30	43.402	283	41.29	33	35.860	319	9.27	26
26.7	47.252	404	53.85	50	31.240	371	36.35	42	43.681	279	41.32	— 3	36.175	315	9.59	— 32
Oct. 6.7	47.645	393	54.51	66	31.602	362	36.86	51	43.953	272	41.70	38	36.480	305	10.46	87
16.6	48.024	379	55.30	79	31.950	348	37.47	61	44.213	260	42.43	73	36.770	290	11.88	142
26.6	48.381	357	56.24	94	32.281	331	38.18	71	44.459	246	43.49	106	37.037	267	13.78	190
Nov. 5.6	48.712	331	57.31	107	32.587	306	38.96	78	44.687	228	44.81	132	37.277	240	16.10	232
15.6	49.009	297	58.50	119	32.865	278	39.82	86	44.887	200	46.36	155	37.483	206	18.77	267
25.5	49.266	257	59.79	129	33.107	242	40.75	93	45.060	173	48.07	171	37.653	170	21.68	291
Dec. 5.5	49.476	210	61.14	135	33.306	199	41.75	100	45.202	142	49.86	179	37.780	127	24.74	306
15.5	49.633	157	62.54	140	33.458	152	42.79	104	45.307	105	51.67	181	37.860	80	27.82	308
25.5	49.730	97	63.95	141	33.557	99	43.83	104	45.370	63	53.44	177	37.890	30	30.83	301
35.4	49.766	36	65.31	136	33.599	42	44.85	102	45.392	22	55.10	166	37.869	— 21	33.66	283
Mean Place	42.164		61.38		26.457		42.40		40.376		51.42		33.610		26.15	
Sec δ, Tan δ	1.437		+1.033		1.306		+0.840		1.007		−0.121		1.220		−0.700	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.09		−0.01		+0.08		−0.01		+0.06		0.00		+0.04		+0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Orionis. (*Bellatrix.*) Mag. 1.7				β Tauri. Mag. 1.8				17 Camelop. Mag. 5.8				β Leporis. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 5 20		° ′ + 6 16		h m 5 21		° ′ +28 32		h m 5 22		° ′ +62 59		h m 5 24		° ′ −20 49	
	s		″		s		″		s		″		s		″	
Jan. 0.4	49.528	14 —	35.57	93	12.980	21 —	24.68	34	35.78	2	67.62	219	48.719	11	29.00	226
10.4	49.542	31	34.64	83	13.001	29	25.02	32	35.76	10	69.81	201	48.708	57	31.26	203
20.4	49.511	73	33.81	70	12.972	78	25.34	28	35.66	20	71.82	174	48.651	99	33.29	175
30.4	49.438	110	33.11	60	12.894	122	25.62	20	35.46	28	73.56	143	48.552	136	35.04	143
Feb. 9.3	49.328	141	32.51	49	12.772	157	25.82	11 —	35.18	34	74.99	103	48.416	168	36.47	109
19.3	49.187	165	32.02	37	12.615	182	25.93	1	34.84	39	76.02	59	48.248	190	37.56	73
Mar. 1.3	49.022	177	31.65	24	12.433	198	25.92	13	34.45	41	76.61	14 —	48.058	203	38.29	35
11.3	48.845	180	31.41	15	12.235	200	25.79	26	34.04	42	76.75	32	47.855	207	38.64	2 —
21.2	48.665	171	31.26	2 —	12.035	191	25.53	36	33.62	40	76.43	76	47.648	199	38.66	35
31.2	48.494	154	31.24	9	11.844	170	25.17	46	33.22	36	75.67	117	47.449	183	38.31	71
Apr. 10.2	48.340	127	31.33	24	11.674	141	24.71	53	32.86	30	74.50	153	47.266	156	37.60	103
20.1	48.213	95	31.57	36	11.533	102	24.18	57	32.56	24	72.97	181	47.110	123	36.57	133
30.1	48.118	55	31.93	49	11.431	58	23.61	57	32.32	16	71.16	205	46.987	86	35.24	162
May 10.1	48.063	13 —	32.42	63	11.373	10 —	23.04	55	32.16	7 —	69.11	218	46.901	44 —	33.62	187
20.1	48.050	30	33.05	77	11.363	39	22.49	50	32.09	3	66.93	225	46.857	2	31.75	208
30.0	48.080	73	33.82	88	11.402	88	21.99	42	32.12	12	64.68	226	46.859	44	29.67	223
June 9.0	48.153	115	34.70	98	11.490	135	21.57	32	32.24	20	62.42	219	46.903	89	27.44	234
19.0	48.268	152	35.68	106	11.625	177	21.25	22	32.44	28	60.23	205	46.992	129	25.10	238
29.0	48.420	185	36.74	111	11.802	215	21.03	12	32.72	36	58.18	188	47.121	167	22.72	236
July 8.9	48.605	216	37.85	111	12.017	248	20.91	2 —	33.08	42	56.30	165	47.288	200	20.36	228
18.9	48.821	239	38.96	108	12.265	274	20.89	7	33.50	49	54.65	141	47.488	227	18.08	210
28.9	49.060	259	40.04	101	12.539	297	20.96	15	33.99	52	53.24	112	47.715	251	15.98	187
Aug. 7.8	49.319	273	41.05	89	12.836	311	21.11	20	34.51	56	52.12	82	47.966	268	14.11	156
17.8	49.592	282	41.94	72	13.147	322	21.31	26	35.07	59	51.30	52	48.234	280	12.55	121
27.8	49.874	287	42.66	55	13.469	328	21.57	26	35.66	60	50.78	19 —	48.514	289	11.34	79
Sept. 6.8	50.161	289	43.21	32	13.797	329	21.83	27	36.26	61	50.59	12	48.803	292	10.55	34 —
16.7	50.450	285	43.53	9 —	14.126	326	22.10	27	36.87	60	50.71	43	49.095	290	10.21	14
26.7	50.735	280	43.62	15	14.452	320	22.37	25	37.47	59	51.14	76	49.385	283	10.35	60
Oct. 6.7	51.015	271	43.47	37	14.772	309	22.62	23	38.06	57	51.90	104	49.668	272	10.95	107
16.7	51.286	256	43.10	59	15.081	296	22.85	22	38.63	54	52.94	133	49.940	256	12.02	149
26.6	51.542	239	42.51	78	15.377	276	23.07	24	39.17	50	54.27	159	50.196	236	13.51	184
Nov. 5.6	51.781	217	41.73	91	15.653	251	23.31	24	39.67	44	55.86	183	50.432	209	15.35	217
15.6	51.998	191	40.82	100	15.904	221	23.55	25	40.11	39	57.69	204	50.641	179	17.52	237
25.5	52.189	158	39.82	106	16.125	186	23.80	29	40.50	31	59.73	219	50.820	145	19.89	250
Dec. 5.5	52.347	122	38.76	107	16.311	144	24.09	32	40.81	23	61.92	229	50.965	104	22.39	254
15.5	52.469	81	37.69	104	16.455	99	24.41	34	41.04	13	64.21	232	51.069	61	24.93	250
25.5	52.550	38	36.65	97	16.554	49	24.75	35	41.17	5	66.53	227	51.130	15	27.43	237
35.4	52.588		35.68		16.603		25.10		41.22		68.80		51.145		29.80	
Mean Place	47.145		38.37		10.218		24.94		30.964		64.74		46.481		23.22	
Sec δ, Tan δ	1.006		+0.110		1.138		+0.544		2.203		+1.963		1.070		−0.380	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.06		0.00		+0.08		−0.01		+0.11		−0.02		+0.05		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Aurigæ. Mag. 4.9				δ Orionis. Mag. 2.5				Groombridge 966. Mag. 6.4				α Leporis. Mag. 2.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 5 27 s		° ′ +32 7 ″		h m 5 27 s		° ′ − 0 21 ″		h m 5 28 s		° ′ +74 59 ″		h m 5 29 s		° ′ −17 52 ″	
Jan. 0.5	30.149		59.65		54.398		32.87		60.92		36.81		11.698		51.39	
10.4	30.175	26	60.20	55	54.414	16	34.17	130	60.85	7	39.52	271	11.695	3	53.54	215
20.4	30.150	25	60.74	54	54.385	29	35.33	116	60.62	23	42.02	250	11.648	47	55.49	195
30.4	30.071	79	61.19	45	54.313	72	36.34	101	60.22	40	44.23	221	11.557	91	57.16	167
Feb. 9.3	29.949	122	61.55	36	54.204	109	37.18	84	59.70	52	46.05	182	11.428	129	58.54	138
19.3	29.788	161	61.79	24	54.064	140	37.83	65	59.07	63	47.41	136	11.267	161	59.60	106
Mar. 1.3	29.600	188	61.90	11	53.899	165	38.31	48	58.35	72	48.27	86	11.084	183	60.33	73
11.3	29.395	205	61.82	8	53.721	178	38.59	28	57.60	75	48.58	31	10.887	197	60.71	38
21.2	29.187	208	61.61	21	53.540	181	38.71	12	56.83	77	48.34	24	10.686	201	60.76	5
31.2	28.987	200	61.24	37	53.365	175	38.64	7	56.09	74	47.58	76	10.491	195	60.47	29
Apr. 10.2	28.807	180	60.73	51	53.207	158	38.39	25	55.41	68	46.31	127	10.312	179	59.85	62
20.2	28.656	151	60.13	60	53.073	134	37.97	42	54.82	59	44.60	171	10.160	152	58.93	92
30.1	28.545	111	59.44	69	52.972	101	37.36	61	54.35	47	42.51	209	10.038	122	57.70	123
May 10.1	28.479	66	58.71	73	52.908	64	36.57	79	54.01	34	40.14	237	9.955	83	56.22	148
20.1	28.462	17	57.99	72	52.884	24	35.62	95	53.81	20	37.55	259	9.913	42	54.48	174
30.0	28.495	33	57.30	69	52.904	20	34.51	111	53.78	3	34.85	270	9.913	0	52.54	194
June 9.0	28.576	81	56.68	62	52.966	62	33.28	123	53.90	12	32.11	274	9.957	44	50.44	210
19.0	28.708	132	56.13	55	53.068	102	31.95	133	54.16	26	29.41	270	10.044	87	48.24	220
29.0	28.883	175	55.66	47	53.208	140	30.55	140	54.58	42	26.83	258	10.171	127	45.99	225
July 8.9	29.097	214	55.31	35	53.383	175	29.12	143	55.12	54	24.42	241	10.334	163	43.74	225
18.9	29.348	251	55.06	25	53.588	205	27.71	141	55.78	66	22.27	215	10.529	195	41.59	215
28.9	29.626	278	54.94	12	53.816	228	26.37	134	56.55	77	20.38	189	10.753	224	39.57	202
Aug. 7.9	29.928	302	54.90	4	54.066	250	25.15	122	57.40	85	18.82	156	10.999	246	37.77	180
17.8	30.247	319	54.93	3	54.331	265	24.09	106	58.32	92	17.62	120	11.263	264	36.27	150
27.8	30.577	330	55.06	13	54.606	275	23.23	86	59.31	99	16.80	82	11.540	277	35.10	117
Sept. 6.8	30.917	340	55.22	16	54.888	282	22.64	59	60.33	102	16.35	45	11.825	285	34.31	79
16.7	31.258	341	55.41	19	55.172	284	22.32	32	61.35	102	16.32	3	12.114	289	33.96	35
26.7	31.599	341	55.65	24	55.455	283	22.29	3	62.38	103	16.68	36	12.401	287	34.05	9
Oct. 6.7	31.932	333	55.90	25	55.733	278	22.58	29	63.40	102	17.45	77	12.683	282	34.60	55
16.7	32.257	325	56.19	29	56.002	269	23.15	57	64.37	97	18.60	115	12.955	272	35.59	99
26.6	32.567	310	56.50	31	56.258	256	23.99	84	65.28	91	20.12	152	13.212	257	36.97	138
Nov. 5.6	32.856	289	56.85	35	56.497	239	25.07	108	66.13	85	21.98	186	13.450	238	38.72	175
15.6	33.122	266	57.22	37	56.715	218	26.33	126	66.88	75	24.17	219	13.663	213	40.76	204
25.6	33.358	236	57.67	45	56.906	191	27.72	139	67.52	64	26.61	244	13.848	185	43.00	224
Dec. 5.5	33.555	197	58.15	48	57.066	160	29.18	146	68.02	50	29.27	266	13.998	150	45.37	237
15.5	33.711	156	58.68	53	57.189	123	30.66	148	68.38	36	32.05	278	14.109	111	47.79	242
25.5	33.821	110	59.24	56	57.272	83	32.11	145	68.57	19	34.89	284	14.177	68	50.17	238
35.4	33.878	57	59.80	56	57.311	39	33.47	136	68.60	3	37.68	279	14.201	24	52.42	225
Mean Place	27.279		59.98		52.066		29.08		53.086		33.91		9.448		45.87	
Sec δ, Tan δ	1.181		+0.628		1.000		−0.006		3.862		+3.730		1.051		−0.323	
$D_\psi\alpha$, $D_\omega\alpha$	+0.08		−0.01		+0.06		0.00		+0.16		−0.03		+0.05		0.00	
$D_\psi\delta$, $D_\omega\delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϕ^1 Orionis. Mag. 4.5				ι Orionis. Mag. 2.9				ε Orionis. Mag. 1.8				ζ Tauri. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 30		+ 9 26		5 31		− 5 57		5 32		− 1 15		5 32		+21 5	
	s		″		s		″		s		″		s		″	
Jan. 0.5	24.799		5.61		30.525		48.13		8.496		13.34		50.809		37.27	
		24		77		15		160		18		136		32		9
10.4	24.823	—	4.84		30.540	—	49.73		8.514	—	14.70		50.841	—	37.18	
		21		67		31		144		26		122		17		6
20.4	24.802		4.17		30.509		51.17		8.488		15.92		50.824		37.12	
		65		59		73		124		69		106		64		5
30.4	24.737		3.58		30.436		52.41		8.419		16.98		50.760		37.07	
		104		49		112		104		108		88		107		4
Feb. 9.3	24.633		3.09		30.324		53.45		8.311		17.86		50.653		37.03	
		136		40		143		80		139		68		141		6
19.3	24.497		2.69		30.181		54.25		8.172		18.54		50.512		36.97	
		162		31		167		58		164		50		169		8
Mar. 1.3	24.335		2.38		30.014		54.83		8.008		19.04		50.343		36.89	
		177		22		181		33		178		30		185		13
11.3	24.158		2.16		29.833		55.16		7.830		19.34		50.158		36.76	
		180		15		186		11		182		12		189		17
21.2	23.978		2.01		29.647		55.27	—	7.648		19.46	—	49.969		36.59	
		175		6		179		14		176		7		183		21
31.2	23.803		1.95	—	29.468		55.13		7.472		19.39		49.786		36.38	
		157		2		163		36		160		27		165		24
Apr. 10.2	23.646		1.97		29.305		54.77		7.312		19.12		49.621		36.14	
		133		12		140		58		137		44		139		24
20.2	23.513		2.09		29.165		54.19		7.175		18.68		49.482		35.90	
		100		24		107		82		104		64		105		23
30.1	23.413		2.33		29.058		53.37		7.071		18.04		49.377		35.67	
		62		34		71		101		68		81		64		20
May 10.1	23.351		2.67		28.987		52.36		7.003		17.23		49.313		35.47	
		20		45		30		121		27		98		19		15
20.1	23.331	—	3.12		28.957	—	51.15		6.976	—	16.25		49.294	—	35.32	
		23		56		11		137		15		114		26		8
30.0	23.354		3.68		28.968		49.78		6.991		15.11		49.320		35.24	
		67		69		54		151		58		127		71		0
June 9.0	23.421		4.37		29.022		48.27		7.049		13.84		49.391		35.24	
		108		77		94		163		97		136		116		8
19.0	23.529		5.14		29.116		46.64		7.146		12.48		49.507		35.32	
		147		85		133		168		136		144		156		17
29.0	23.676		5.99		29.249		44.96		7.282		11.04		49.663		35.49	
		180		90		168		170		170		146		192		25
July 8.9	23.856		6.89		29.417		43.26		7.452		9.58		49.855		35.74	
		212		92		198		165		201		144		224		31
18.9	24.068		7.81		29.615		41.61		7.653		8.14		50.079		36.05	
		236		91		224		157		225		137		251		35
28.9	24.304		8.72		29.839		40.04		7.878		6.77		50.330		36.40	
		257		85		244		142		246		125		272		37
Aug. 7.9	24.561		9.57		30.083		38.62		8.124		5.52		50.602		36.77	
		272		75		262		121		263		107		288		36
17.8	24.833		10.32		30.345		37.41		8.387		4.45		50.890		37.13	
		282		63		272		96		274		87		299		34
27.8	25.115		10.95		30.617		36.45		8.661		3.58		51.189		37.47	
		288		48		280		66		280		60		308		29
Sept. 6.8	25.403		11.43		30.897		35.79		8.941		2.98		51.497		37.76	
		291		27		283		33		284		31		309		20
16.7	25.694		11.70		31.180		35.46	—	9.225		2.67		51.806		37.96	
		291		9		282		1		283		2		309		13
26.7	25.985		11.79	—	31.462		35.47		9.508		2.65	—	52.115		38.09	
		285		12		278		37		279		30		304		4
Oct. 6.7	26.270		11.67		31.740		35.84		9.787		2.95		52.419		38.13	—
		277		34		269		72		270		61		297		4
16.7	26.547		11.33		32.009		36.56		10.057		3.56		52.716		38.09	
		265		51		256		102		257		87		285		12
26.6	26.812		10.82		32.265		37.58		10.314		4.43		53.001		37.97	
		249		67		239		131		242		113		268		18
Nov. 5.6	27.061		10.15		32.504		38.89		10.556		5.56		53.269		37.79	
		228		79		217		153		220		131		246		21
15.6	27.289		9.36		32.721		40.42		10.776		6.87		53.515		37.58	
		201		87		192		169		195		144		218		22
25.6	27.490		8.49		32.913		42.11		10.971		8.31		53.733		37.36	
		170		91		159		178		163		153		187		22
Dec. 5.5	27.660		7.58		33.072		43.89		11.134		9.84		53.920		37.14	
		134		91		122		181		126		154		148		19
15.5	27.794		6.67		33.194		45.70		11.260		11.38		54.068		36.95	
		94		87		81		177		87		151		105		15
25.5	27.888		5.80		33.275		47.47		11.347		12.89		54.173		36.80	
		49		81		39		167		43		143		58		11
35.4	27.937		4.99		33.314		49.14		11.390		14.32		54.231		36.69	
Mean Place	22.364		8.49		28.228		43.68		6.163		9.33		48.190		39.09	
Sec δ, Tan δ	1.014		+0.166		1.005		−0.104		1.000		−0.022		1.072		+0.386	
$D_{\psi}a$, $D_{\omega}a$	+0.07		0.00		+0.06		0.00		+0.06		0.00		+0.07		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Orionis. Mag. 2.0				α Columbæ. Mag. 2.8				ο Aurigæ. Mag. 5.5				ζ Leporis. Mag. 3.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 36		− 1 58		5 36		−34 6		5 39		+49 47		5 43		−14 50	
	s		″		s		″		s		″		s		″	
Jan. 0.5	42.615	22	68.62	142	45.260	25	66.70	282	41.028	37	32.09	156	19.362	15	69.76	208
10.4	42.637	24	70.04	128	45.235	76	69.52	254	41.065	34	33.65	147	19.377	32	71.84	190
20.4	42.613	66	71.32	110	45.159	123	72.06	220	41.031	102	35.12	133	19.345	76	73.74	164
30.4	42.547	105	72.42	92	45.036	167	74.26	183	40.929	161	36.45	110	19.269	116	75.38	138
Feb. 9.3	42.442	137	73.34	71	44.869	201	76.09	141	40.768	213	37.55	85	19.153	148	76.76	107
19.3	42.305	163	74.05	52	44.668	226	77.50	96	40.555	252	38.40	54	19.005	175	77.83	76
Mar. 1.3	42.142	177	74.57	33	44.442	242	78.46	51	40.303	275	38.94	21	18.830	190	78.59	46
11.3	41.965	182	74.90	12	44.200	247	78.97	6	40.028	284	39.15	13	18.640	196	79.05	13
21.2	41.783	178	75.02	7	43.953	241	79.03	39	39.744	275	39.02	46	18.444	192	79.18	18
31.2	41.605	162	74.95	27	43.712	225	78.64	83	39.469	252	38.56	77	18.252	179	79.00	47
Apr. 10.2	41.443	139	74.68	47	43.487	198	77.81	123	39.217	216	37.79	104	18.073	154	78.53	78
20.2	41.304	108	74.21	64	43.289	165	76.58	161	39.001	169	36.75	127	17.919	125	77.75	106
30.1	41.196	71	73.57	84	43.124	125	74.97	196	38.832	113	35.48	145	17.794	91	76.69	130
May 10.1	41.125	32	72.73	100	42.999	81	73.01	225	38.719	52	34.03	155	17.703	49	75.39	155
20.1	41.093	11	71.73	115	42.918	34	70.76	251	38.667	12	32.48	163	17.654	8	73.84	174
30.0	41.104	52	70.58	130	42.884	14	68.25	268	38.679	77	30.85	161	17.646	35	72.10	191
June 9.0	41.156	92	69.28	139	42.898	63	65.57	280	38.756	141	29.24	158	17.681	76	70.19	202
19.0	41.248	132	67.89	146	42.961	108	62.77	285	38.897	198	27.66	150	17.757	116	68.17	208
29.0	41.380	166	66.43	148	43.069	151	59.92	282	39.095	251	26.16	138	17.873	152	66.09	209
July 8.9	41.546	196	64.95	148	43.220	189	57.10	270	39.346	298	24.78	121	18.025	184	64.00	203
18.9	41.742	222	63.47	138	43.409	225	54.40	250	39.644	339	23.57	104	18.209	213	61.97	191
28.9	41.964	243	62.09	126	43.634	255	51.90	222	39.983	371	22.53	85	18.422	236	60.06	170
Aug. 7.9	42.207	261	60.83	110	43.889	278	49.68	187	40.354	399	21.68	65	18.658	255	58.36	147
17.8	42.468	271	59.73	86	44.167	297	47.81	143	40.753	417	21.03	45	18.913	269	56.89	114
27.8	42.739	279	58.87	62	44.464	309	46.38	93	41.170	430	20.58	24	19.182	280	55.75	78
Sept. 6.8	43.018	283	58.25	31	44.773	316	45.45	42	41.600	437	20.34	4	19.462	284	54.97	38
16.7	43.301	283	57.94	1	45.089	317	45.03	14	42.037	439	20.30	16	19.746	286	54.59	4
26.7	43.584	279	57.95	31	45.406	311	45.17	71	42.476	434	20.46	36	20.032	284	54.63	47
Oct. 6.7	43.863	272	58.26	64	45.717	299	45.88	125	42.910	423	20.82	55	20.316	276	55.10	89
16.7	44.135	259	58.90	90	46.016	283	47.13	176	43.333	406	21.37	76	20.592	263	55.99	129
26.6	44.394	244	59.80	117	46.299	259	48.89	221	43.739	383	22.13	93	20.855	247	57.28	163
Nov. 5.6	44.638	224	60.97	134	46.558	230	51.10	258	44.122	350	23.06	112	21.102	226	58.91	191
15.6	44.862	198	62.31	150	46.788	193	53.68	285	44.472	310	24.18	128	21.328	197	60.82	213
25.6	45.060	166	63.81	158	46.981	152	56.53	304	44.782	263	25.46	142	21.525	165	62.95	225
Dec. 5.5	45.226	130	65.39	160	47.133	107	59.57	310	45.045	206	26.88	152	21.690	127	65.20	231
15.5	45.356	92	66.99	156	47.240	57	62.67	306	45.251	143	28.40	159	21.817	86	67.51	227
25.5	45.448	47	68.55	148	47.297	5	65.73	293	45.394	76	29.99	159	21.903	40	69.78	218
35.4	45.495		70.03		47.302		68.66		45.470		31.58		21.943		71.96	
Mean Place	40.282		64.42		42.954		60.00		37.398		31.94		17.080		64.39	
Sec δ, Tan δ	1.001		−0.035		1.208		−0.677		1.549		+1.183		1.035		−0.265	
$D_\psi a$, $D_\omega a$	+0.06		0.00		+0.04		0.00		+0.09		−0.01		+0.05		0.00	
$D_\psi \delta$, $D_\omega \delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Orionis. Mag. 2.2				δ Doradus. Mag. 4.5				ν Aurigæ. Mag. 4.2				δ Leporis. Mag. 3.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 43		− 9 41		5 44		−65 45		5 45		+39 7		5 47		−20 52	
	s		″		s		″		s		″		s		″	
Jan. 0.5	57.177		55.83		40.76		64.89		55.632		32.96		52.525		72.07	
		21		185		18		338		49		97		12		240
10.4	57.198	—	57.68		40.58		68.27		55.681	—	33.93		52.537	—	74.47	
		25		165		28		307		11		93		36		217
20.4	57.173		59.33		40.30		71.34		55.670		34.86		52.501		76.64	
		69		146		36		268		69		86		81		192
30.4	57.104		60.79		39.94		74.02		55.601		35.72		52.420		78.56	
		108		120		44		223		121		73		123		159
Feb. 9.4	56.996		61.99		39.50		76.25		55.480		36.45		52.297		80.15	
		141		95		50		173		166		57		157		126
19.3	56.855		62.94		39.00		77.98		55.314		37.02		52.140		81.41	
		167		68		54		119		201		37		182		91
Mar. 1.3	56.688		63.62		38.46		79.17		55.113		37.39		51.958		82.32	
		183		41		56		65		221		15		200		55
11.3	56.505		64.03		37.90		79.82		54.892		37.54	—	51.758		82.87	
		190		14		57		10		231		8		205		18
21.2	56.315		64.17	—	37.33		79.92	—	54.661		37.46		51.553		83.05	—
		185		13		57		46		226		32		206		18
31.2	56.130		64.04		36.76		79.46		54.435		37.14		51.347		82.87	
		171		39		54		97		207		52		190		54
Apr. 10.2	55.959		63.65		36.22		78.49		54.228		36.62		51.157		82.33	
		149		65		50		146		178		71		167		86
20.2	55.810		63.00		35.72		77.03		54.050		35.91		50.990		81.47	
		119		88		44		192		141		86		138		118
30.1	55.691		62.12		35.28		75.11		53.909		35.05		50.852		80.29	
		83		113		37		231		92		98		102		147
May 10.1	55.608		60.99		34.91		72.80		53.817		34.07		50.750		78.82	
		45		132		30		268		42		103		62		173
20.1	55.563		59.67		34.61		70.12		53.775	—	33.04		50.688		77.09	
		2		151		22		297		12		107		20		196
30.1	55.561	—	58.16		34.39		67.15		53.787		31.97		50.668	—	75.13	
		39		166		13		317		66		106		23		213
June 9.0	55.600		56.50		34.26		63.98		53.853		30.91		50.691		73.00	
		80		177		3		330		116		101		67		225
19.0	55.680		54.73		34.23	—	60.68		53.969		29.90		50.758		70.75	
		120		184		7		336		166		93		110		233
29.0	55.800		52.89		34.30		57.32		54.135		28.97		50.868		68.42	
		154		185		14		331		211		83		143		231
July 8.9	55.954		51.04		34.44		54.01		54.346		28.14		51.011		66.11	
		185		180		23		317		250		71		180		225
18.9	56.139		49.24		34.67		50.84		54.596		27.43		51.191		63.86	
		214		170		31		293		285		60		210		210
28.9	56.353		47.54		34.98		47.91		54.881		26.83		51.401		61.76	
		236		154		39		260		311		48		235		190
Aug. 7.9	56.589		46.00		35.37		45.31		55.192		26.35		51.636		59.86	
		254		131		45		218		336		36		255		160
17.8	56.843		44.69		35.82		43.13		55.528		25.99		51.891		58.26	
		268		104		49		168		353		24		273		125
27.8	57.111		43.65		36.31		41.45		55.881		25.75		52.164		57.01	
		277		71		55		112		362		13		283		86
Sept. 6.8	57.388		42.94		36.86		40.33		56.243		25.62		52.447		56.15	
		282		35		55		49		369		3		290		41
16.8	57.670		42.59	—	37.41		39.84	—	56.612		25.59	—	52.737		55.74	—
		284		2		57		15		369		6		292		6
26.7	57.954		42.61		37.98		39.99		56.981		25.65		53.029		55.80	
		281		41		56		80		368		17		290		53
Oct. 6.7	58.235		43.02		38.54		40.79		57.349		25.82		53.319		56.33	
		274		80		52		146		362		27		282		101
16.7	58.509		43.82		39.06		42.25		57.711		26.09		53.601		57.34	
		262		115		49		205		347		36		271		145
26.6	58.771		44.97		39.55		44.30		58.058		26.45		53.872		58.79	
		248		144		44		258		330		47		252		182
Nov. 5.6	59.019		46.41		39.99		46.88		58.388		26.92		54.124		60.61	
		226		171		36		302		304		57		231		216
15.6	59.245		48.12		40.35		49.90		58.692		27.49		54.355		62.77	
		200		189		28		336		273		69		201		239
25.6	59.445		50.01		40.63		53.26		58.965		28.18		54.556		65.16	
		168		200		19		359		233		78		167		256
Dec. 5.5	59.613		52.01		40.82		56.85		59.198		28.96		54.723		67.72	
		132		205		8		368		191		87		129		262
15.5	59.745		54.06		40.90	—	60.53		59.389		29.83		54.852		70.34	
		91		201		1		366		136		94		84		258
25.5	59.836		56.07		40.89		64.19		59.525		30.77		54.936		72.92	
		47		192		12		351		81		98		39		249
35.5	59.883		57.99		40.77		67.70		59.606		31.75		54.975		75.41	
Mean Place	54.876		50.84		37.517		57.32		52.513		34.19		50.243		66.28	
Sec δ, Tan δ	1.015		−0.171		2.436		−2.222		1.289		+0.813		1.070		−0.382	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.06		0.00		0.00		+0.01		+0.08		0.00		+0.05		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Orionis. (*Betelgeux.*) Var. 1.0–1.4		η Leporis. Mag. 3.8		δ Aurigæ. Mag. 3.9		β Aurigæ. Mag. 2.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 5 50	° ′ + 7 23	h m 5 52	° ′ −14 10	h m 5 52	° ′ +54 16	h m 5 53	° ′ +44 56
	s	″	s	″	s	″	s	″
Jan. 0.5	49.618	31.03	45.222	59.10	55.476	47.84	38.645	24.84
	41	93	25	209	55	181	57	130
10.4	49.659 —	30.10	45.247 —	61.19	55.531 —	49.65	38.702 —	26.14
	5	83	22	190	24	173	9	126
20.4	49.654	29.27	45.225	63.09	55.507	51.38	38.693	27.40
	49	69	68	166	101	158	72	116
30.4	49.605	28.58	45.157	64.75	55.406	52.96	38.621	28.56
	92	58	108	140	169	137	130	101
Feb. 9.4	49.513	28.00	45.049	66.15	55.237	54.33	38.491	29.57
	128	46	142	110	229	108	180	80
19.3	49.385	27.54	44.907	67.25	55.008	55.41	38.311	30.37
	155	35	170	79	274	76	219	57
Mar. 1.3	49.230	27.19	44.737	68.04	54.734	56.17	38.092	30.94
	173	23	187	50	304	39	244	28
11.3	49.057	26.96	44.550	68.54	54.430	56.56	37.848	31.22
	181	13	195	18	316	3	256	0
21.3	48.876	26.83	44.355	68.72 —	54.114	56.59 —	37.592	31.22
	177	3	192	13	311	36	251	29
31.2	48.699	26.80 —	44.163	68.59	53.803	56.23	37.341	30.93
	164	7	181	42	291	72	235	56
Apr. 10.2	48.535	26.87	43.982	68.17	53.512	55.51	37.106	30.37
	143	19	158	72	254	105	203	81
20.2	48.392	27.06	43.824	67.45	53.258	54.46	36.903	29.56
	112	29	130	98	205	131	163	101
30.1	48.280	27.35	43.694	66.47	53.053	53.15	36.740	28.55
	76	41	96	125	146	154	113	119
May 10.1	48.204	27.76	43.598	65.22	52.907	51.61	36.627	27.36
	37	53	56	147	82	171	59	129
20.1	48.167 —	28.29	43.542	63.75	52.825	49.90	36.568	26.07
	5	64	15	169	12	181	0	135
30.1	48.172	28.93	43.527 —	62.06	52.813 —	48.09	36.568	24.72
	46	75	27	183	58	186	57	137
June 9.0	48.218	29.68	43.554	60.23	52.871	46.23	36.625	23.35
	88	83	68	196	126	184	114	135
19.0	48.306	30.51	43.622	58.27	52.997	44.39	36.739	22.00
	126	91	108	203	193	178	168	128
29.0	48.432	31.42	43.730	56.24	53.190	42.61	36.907	20.72
	161	94	143	204	251	167	218	118
July 8.9	48.593	32.36	43.873	54.20	53.441	40.94	37.125	19.54
	192	95	177	200	305	153	262	108
18.9	48.785	33.31	44.050	52.20	53.746	39.41	37.387	18.46
	219	93	206	188	352	136	299	94
28.9	49.004	34.24	44.256	50.32	54.098	38.05	37.686	17.52
	241	86	230	169	392	116	331	80
Aug. 7.9	49.245	35.10	44.486	48.63	54.490	36.89	38.017	16.72
	260	74	250	145	423	95	357	63
17.8	49.505	35.84	44.736	47.18	54.913	35.94	38.374	16.09
	272	61	265	115	449	72	376	49
27.8	49.777	36.45	45.001	46.03	55.362	35.22	38.750	15.60
	281	42	277	79	466	50	390	33
Sept. 6.8	50.058	36.87	45.278	45.24	55.828	34.72	39.140	15.27
	287	22	282	41	477	26	400	17
16.8	50.345	37.09	45.560	44.83 —	56.305	34.46	39.540	15.10
	290	0	285	1	482	2	403	3
26.7	50.635	37.09	45.845	44.84	56.787	34.44 —	39.943	15.07 —
	288	24	284	44	480	23	402	14
Oct. 6.7	50.923	36.85	46.129	45.28	57.267	34.67	40.345	15.21
	283	45	279	86	473	46	394	30
16.7	51.206	36.40	46.408	46.14	57.740	35.13	40.739	15.51
	274	66	269	125	455	71	382	44
26.6	51.480	35.74	46.677	47.39	58.195	35.84	41.121	15.95
	259	83	252	160	431	95	364	61
Nov. 5.6	51.739	34.91	46.929	48.99	58.626	36.79	41.485	16.56
	242	96	232	188	398	117	338	77
15.6	51.981	33.95	47.161	50.87	59.024	37.96	41.823	17.33
	217	105	206	211	355	137	303	92
25.6	52.198	32.90	47.367	52.98	59.379	39.33	42.126	18.25
	188	110	175	223	304	155	262	106
Dec. 5.5	52.386	31.80	47.542	55.21	59.683	40.88	42.388	19.31
	152	110	137	229	242	171	212	119
15.5	52.538	30.70	47.679	57.50	59.925	42.59	42.600	20.50
	111	105	95	227	173	180	155	127
25.5	52.649	29.65	47.774	59.77	60.098	44.39	42.755	21.77
	68	98	51	218	97	183	92	131
35.5	52.717	28.67	47.825	61.95	60.195	46.22	42.847	23.08
Mean Place	47.179	34.96	42.926	53.70	51.520	48.70	35.268	26.34
Sec δ, Tan δ	1.008	+0.130	1.032	−0.253	1.713	+1.391	1.413	+0.998
$D_{\psi}a$, $D_{\omega}a$	+0.06	0.00	+0.05	0.00	+0.10	0.00	+0.09	0.00
$D_{\psi}\delta$, $D_{\omega}\delta$	0.0	+1.0	0.0	+1.0	0.0	+1.0	0.0	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Aurigæ. Mag. 2.7				1 Geminorum. Mag. 4.3				1 G. Puppis. Mag. 6.2				ν Orionis. Mag. 4.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 5 54		° ′ +37 12		h m 5 59		° ′ +23 16		h m 6 2		° ′ −45 1		h m 6 2		° ′ +14 46	
	s		″		s		″		s		″		s		″	
Jan. 0.5	14.927	58	27.36	85	14.488	59	4.46	0	11.025	24	76.22	326	59.407	58	41.22	52
10.4	14.985	2	28.21	84	14.547	8	4.46	5	11.001	85	79.48	299	59.465	9	40.70	44
20.4	14.983	58	29.05	79	14.555	43	4.51	9	10.916	143	82.47	265	59.474	39	40.26	34
30.4	14.925	111	29.84	68	14.512	90	4.60	10	10.773	194	85.12	227	59.435	84	39.92	27
Feb. 9.4	14.814	155	30.52	56	14.422	129	4.70	10	10.579	235	87.39	181	59.351	122	39.65	19
19.3	14.659	190	31.08	38	14.293	161	4.80	6	10.344	270	89.20	134	59.229	151	39.46	16
Mar. 1.3	14.469	213	31.46	18	14.132	182	4.86	1	10.074	292	90.54	84	59.078	174	39.30	11
11.3	14.256	225	31.64	2	13.950	192	4.87	6	9.782	302	91.38	33	58.904	182	39.19	9
21.3	14.031	221	31.62	25	13.758	190	4.81	11	9.480	301	91.71	17	58.722	182	39.10	6
31.2	13.810	204	31.37	43	13.568	178	4.70	18	9.179	288	91.54	64	58.540	170	39.04	3
Apr. 10.2	13.606	177	30.94	60	13.390	154	4.52	23	8.891	264	90.90	113	58.370	149	39.01	0
20.2	13.429	142	30.34	76	13.236	123	4.29	25	8.627	231	89.77	156	58.221	119	39.01	5
30.1	13.287	97	29.58	86	13.113	85	4.04	26	8.396	191	88.21	196	58.102	85	39.06	10
May 10.1	13.190	46	28.72	93	13.028	43	3.78	24	8.205	144	86.25	230	58.017	45	39.16	16
20.1	13.144	4	27.79	96	12.985	2	3.54	21	8.061	92	83.95	262	57.972	3	39.32	25
30.1	13.148	56	26.83	95	12.987	46	3.33	17	7.969	41	81.33	284	57.969	40	39.57	30
June 9.0	13.204	106	25.88	92	13.033	91	3.16	12	7.928	14	78.49	302	58.009	82	39.87	38
19.0	13.310	155	24.96	85	13.124	133	3.04	6	7.942	68	75.47	309	58.091	121	40.25	43
29.0	13.465	199	24.11	78	13.257	171	2.98	0	8.010	117	72.38	309	58.212	158	40.68	49
July 9.0	13.664	236	23.33	68	13.428	205	2.98	6	8.127	168	69.29	299	58.370	189	41.17	51
18.9	13.900	271	22.65	56	13.633	233	3.04	9	8.295	212	66.30	284	58.559	218	41.68	51
28.9	14.171	299	22.09	48	13.866	258	3.13	11	8.507	253	63.46	252	58.777	241	42.19	48
Aug. 7.9	14.470	321	21.61	37	14.124	279	3.24	11	8.760	284	60.94	217	59.018	262	42.67	42
17.8	14.791	338	21.24	27	14.403	292	3.35	10	9.044	315	58.77	174	59.280	275	43.09	33
27.8	15.129	351	20.97	19	14.695	305	3.45	6	9.359	335	57.03	122	59.555	286	43.42	21
Sept. 6.8	15.480	358	20.78	11	15.000	311	3.51	1	9.694	351	55.81	66	59.841	294	43.63	9
16.8	15.838	361	20.67	2	15.311	314	3.52	6	10.045	357	55.15	5	60.135	298	43.72	6
26.7	16.199	360	20.65	5	15.625	314	3.46	12	10.402	357	55.10	56	60.433	299	43.66	21
Oct. 6.7	16.559	354	20.70	13	15.939	311	3.34	18	10.759	348	55.66	117	60.732	296	43.45	36
16.7	16.913	344	20.83	23	16.250	302	3.16	25	11.107	333	56.83	175	61.028	288	43.09	50
26.7	17.257	328	21.06	31	16.552	289	2.91	26	11.440	307	58.58	227	61.316	277	42.59	60
Nov. 5.6	17.585	305	21.37	41	16.841	271	2.65	27	11.747	274	60.85	272	61.593	258	41.99	69
15.6	17.890	277	21.78	52	17.112	246	2.38	26	12.021	235	63.57	307	61.851	237	41.30	72
25.6	18.167	239	22.30	62	17.358	214	2.12	21	12.256	185	66.64	331	62.088	206	40.58	73
Dec. 5.5	18.406	195	22.92	73	17.572	178	1.91	16	12.441	132	69.95	344	62.294	171	39.85	68
15.5	18.601	145	23.65	79	17.750	134	1.75	10	12.573	74	73.39	345	62.465	130	39.17	64
25.5	18.746	89	24.44	85	17.884	87	1.65	2	12.647	12	76.84	335	62.595	84	38.53	56
35.5	18.835		25.29		17.971		1.63		12.659		80.19		62.679		37.97	
Mean Place	11.868		29.40		11.800		7.77		8.534		69.72		56.863		45.24	
Sec δ, Tan δ	1.256		+0.759		1.089		+0.430		1.415		−1.001		1.034		+0.264	
$D_\psi a$, $D_\omega a$	+0.08		0.00		+0.07		0.00		+0.03		0.00		+0.07		0.00	
$D_\psi \delta$, $D_\omega \delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	22 H. Camelop. Mag. 4.7				η Geminorum. Var. 3.2–4.2				2 Lyncis. Mag. 4.4				ζ Canis Majoris. Mag. 3.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 6 9		° ′ +69 20		h m 6 9		° ′ +22 31		h m 6 12		° ′ +59 2		h m 6 17		° ′ −30 1	
	s		″		s		″		s		″		s		″	
Jan. 0.5	61.50	7	59.55	253	62.024	69	49.12	6	33.189	88	28.75	206	14.484	28	42.93	288
10.5	61.57	— 4	62.08	246	62.093	17	49.06	— 1	33.277	— 3	30.81	201	14.512	— 25	45.81	267
20.4	61.53	17	64.54	229	62.110	— 33	49.07	6	33.274	91	32.82	189	14.487	76	48.48	240
30.4	61.36	29	66.83	201	62.077	81	49.13	10	33.183	173	34.71	168	14.411	122	50.88	206
Feb. 9.4	61.07	40	68.84	166	61.996	123	49.23	10	33.010	244	36.39	141	14.289	163	52.94	168
19.3	60.67	46	70.50	125	61.873	155	49.33	7	32.766	301	37.80	106	14.126	194	54.62	128
Mar. 1.3	60.21	52	71.75	78	61.718	178	49.40	4	32.465	340	38.86	68	13.932	217	55.90	87
11.3	59.69	55	72.53	28	61.540	190	49.44	— 1	32.125	362	39.54	27	13.715	229	56.77	45
21.3	59.14	55	72.81	— 22	61.350	190	49.43	6	31.763	362	39.81	— 16	13.486	230	57.22	1
31.2	58.59	52	72.59	71	61.160	180	49.37	12	31.401	346	39.65	56	13.256	220	57.23	— 40
Apr. 10.2	58.07	48	71.88	116	60.980	158	49.25	16	31.055	311	39.09	94	13.036	203	56.83	81
20.2	57.59	39	70.72	157	60.822	128	49.09	19	30.744	263	38.15	128	12.833	176	56.02	119
30.2	57.20	32	69.15	191	60.694	93	48.90	21	30.481	202	36.87	158	12.657	143	54.83	154
May 10.1	56.88	22	67.24	219	60.601	51	48.69	19	30.279	131	35.29	179	12.514	104	53.29	185
20.1	56.66	12	65.05	238	60.550	8	48.50	18	30.148	56	33.50	196	12.410	62	51.44	213
30.1	56.54	0	62.67	250	60.542	— 36	48.32	13	30.092	— 21	31.54	206	12.348	18	49.31	235
June 9.0	56.54	12	60.17	256	60.578	80	48.19	9	30.113	98	29.48	210	12.330	— 26	46.96	251
19.0	56.66	22	57.61	254	60.658	121	48.10	4	30.211	172	27.38	208	12.356	70	44.45	262
29.0	56.88	32	55.07	245	60.779	159	48.06	— 1	30.383	243	25.30	200	12.426	111	41.83	263
July 9.0	57.20	42	52.62	231	60.938	193	48.07	4	30.626	306	23.30	189	12.537	150	39.20	258
18.9	57.62	51	50.31	211	61.131	223	48.11	7	30.932	362	21.41	173	12.687	184	36.62	245
28.9	58.13	57	48.20	189	61.354	249	48.18	9	31.294	410	19.68	154	12.871	216	34.17	223
Aug. 7.9	58.70	63	46.31	160	61.603	269	48.27	7	31.704	453	18.14	133	13.087	243	31.94	194
17.9	59.33	69	44.71	131	61.872	285	48.34	5	32.157	485	16.81	108	13.330	267	30.00	156
27.8	60.02	72	43.40	99	62.157	298	48.39	0	32.642	510	15.73	84	13.597	284	28.44	114
Sept. 6.8	60.74	76	42.41	65	62.455	308	48.39	6	33.152	528	14.89	57	13.881	298	27.30	64
16.8	61.50	77	41.76	28	62.763	312	48.33	14	33.680	541	14.32	29	14.179	307	26.66	12
26.7	62.27	77	41.48	— 7	63.075	314	48.19	21	34.221	543	14.03	2	14.486	309	26.54	— 42
Oct. 6.7	63.04	76	41.55	44	63.389	312	47.98	27	34.764	536	14.01	— 28	14.795	305	26.96	97
16.7	63.80	74	41.99	81	63.701	304	47.71	33	35.300	524	14.29	56	15.100	298	27.93	147
26.7	64.54	70	42.80	118	64.005	295	47.38	36	35.824	501	14.85	86	15.398	283	29.40	194
Nov. 5.6	65.24	65	43.98	152	64.300	277	47.02	37	36.325	467	15.71	114	15.681	260	31.34	234
15.6	65.89	58	45.50	183	64.577	254	46.65	36	36.792	421	16.85	139	15.941	233	33.68	267
25.6	66.47	49	47.33	211	64.831	223	46.29	32	37.213	366	18.24	164	16.174	196	36.35	289
Dec. 5.6	66.96	39	49.44	233	65.054	188	45.97	23	37.579	300	19.88	183	16.370	154	39.24	301
15.5	67.35	28	51.77	247	65.242	145	45.74	18	37.879	221	21.71	198	16.524	108	42.25	303
25.5	67.63	16	54.24	256	65.387	97	45.56	9	38.100	137	23.69	207	16.632	58	45.28	297
35.5	67.79		56.80		65.484		45.47		38.237		25.76		16.690		48.25	
Mean Place	55.461		61.52		59.344		53.15		28.801		31.41		12.133		37.07	
Sec δ, Tan δ	2.835		+2.653		1.083		+0.415		1.944		+1.667		1.155		−0.578	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.13		+0.01		+0.07		0.00		+0.11		+0.01		+0.05		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Geminorum. Mag. 3.2				ψ¹ Aurigæ. Mag. 5.1				β Canis Majoris. Mag. 2.0				8 Monocerotis. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 6 18		° ′ +22 33		h m 6 18		° ′ +49 19		h m 6 19		° ′ −17 54		h m 6 19		° ′ + 4 37	
	s		″		s		″		s		″		s		″	
Jan. 0.5	6.329		18.40		43.405		47.13		10.259		58.67		31.016		61.00	
10.5	6.407	78	18.32	8 —	43.498	93	48.67	154	10.305	46 —	61.05	238	31.082	66	59.84	116
20.4	6.432	25 —	18.33	1	43.518	20 —	50.21	154	10.302	3	63.24	219	31.101	19 —	58.80	104
30.4	6.406	26	18.40	7	43.466	52	51.68	147	10.251	51	65.20	196	31.072	29	57.91	89
Feb. 9.4	6.332	74	18.50	10	43.349	117	53.02	134	10.157	94	66.87	167	30.999	73	57.19	72
19.3	6.215	117	18.62	12	43.172	177	54.15	113	10.023	134	68.23	136	30.887	112	56.61	58
Mar. 1.3	6.065	150	18.72	10	42.947	225	55.03	88	9.857	166	69.26	103	30.745	142	56.18	43
11.3	5.889	176	18.79	7	42.689	258	55.61	58	9.671	186	69.96	70	30.579	166	55.90	28
21.3	5.700	189	18.82	3 —	42.412	277	55.88	27 —	9.473	198	70.32	36	30.401	178	55.75	15
31.2	5.510	190	18.79	3	42.134	278	55.81	7	9.273	200	70.34	2 —	30.221	180	55.73	2 —
Apr. 10.2	5.329	181	18.70	9	41.868	266	55.42	39	9.082	191	70.03	31	30.051	170	55.84	11
20.2	5.168	161	18.56	14	41.627	241	54.72	70	8.908	174	69.40	63	29.897	154	56.09	25
30.2	5.035	133	18.39	17	41.426	201	53.76	96	8.759	149	68.47	93	29.770	127	56.45	36
May 10.1	4.937	98	18.20	19	41.273	153	52.56	120	8.642	117	67.24	123	29.674	96	56.94	49
20.1	4.880	57	18.01	19	41.176	97	51.19	137	8.562	80	65.77	147	29.615	59	57.54	60
30.1	4.865	15 —	17.84	17	41.137	39 —	49.69	150	8.520	42	64.06	171	29.595	20 —	58.27	73
June 9.0	4.894	29	17.69	15	41.159	22	48.11	158	8.519	1 —	62.16	190	29.615	20	59.10	83
19.0	4.966	72	17.58	11	41.243	84	46.49	162	8.559	40	60.13	203	29.675	60	60.01	91
29.0	5.079	113	17.52	6	41.386	143	44.89	160	8.639	80	58.00	213	29.772	97	60.99	98
July 9.0	5.231	152	17.49	3	41.583	197	43.35	154	8.756	117	55.85	215	29.905	133	61.99	100
18.9	5.417	186	17.49	0	41.829	246	41.89	146	8.908	152	53.75	210	30.071	166	63.00	101
28.9	5.633	216	17.52	3	42.120	291	40.54	135	9.090	182	51.74	201	30.264	193	63.96	96
Aug. 7.9	5.875	242	17.56	4	42.448	328	39.34	120	9.301	211	49.91	183	30.483	219	64.84	88
17.9	6.139	264	17.58	2 —	42.809	361	38.28	106	9.534	233	48.32	159	30.721	238	65.59	75
27.8	6.420	281	17.57	1	43.197	388	37.39	89	9.788	254	47.04	128	30.978	257	66.19	60
Sept. 6.8	6.715	295	17.51	6	43.605	408	36.68	71	10.056	268	46.12	92	31.247	269	66.59	40
16.8	7.021	306	17.38	13	44.028	423	36.14	54	10.336	280	45.62	50	31.526	279	66.75	16 —
26.7	7.333	312	17.19	19	44.460	432	35.79	35	10.624	288	45.56	6 —	31.811	285	66.67	8
Oct. 6.7	7.648	315	16.93	26	44.896	436	35.62	17 —	10.915	291	45.95	39	32.100	289	66.32	35
16.7	7.962	314	16.60	33	45.332	436	35.69	7	11.204	289	46.80	85	32.388	288	65.73	59
26.7	8.271	309	16.21	39	45.759	427	35.96	27	11.487	283	48.08	128	32.671	283	64.91	82
Nov. 5.6	8.569	298	15.79	42	46.170	411	36.43	47	11.758	271	49.75	167	32.945	274	63.89	102
15.6	8.852	283	15.37	42	46.556	386	37.13	70	12.010	252	51.75	200	33.203	258	62.71	118
25.6	9.112	260	14.96	41	46.910	354	38.04	91	12.239	229	54.00	225	33.441	238	61.41	130
Dec. 5.6	9.345	233	14.60	36	47.221	311	39.16	112	12.437	198	56.43	243	33.651	210	60.06	135
15.5	9.540	195	14.31	29	47.481	260	40.44	128	12.598	161	58.95	252	33.827	176	58.71	135
25.5	9.692	152	14.10	21	47.680	199	41.87	143	12.717	119	61.48	253	33.963	136	57.40	131
35.5	9.798	106	13.99	11	47.813	133	43.39	152	12.789	72	63.93	245	34.057	94	56.17	123
Mean Place	3.648		22.93		39.790		50.77		7.938		53.01		28.585		66.17	
Sec δ, Tan δ	1.083		+0.415		1.534		+1.164		1.051		−0.323		1.003		+0.081	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.07		0.00		+0.09		+0.01		+0.05		0.00		+0.06		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Argus. (*Canopus.*) Mag. −0.9				10 Monocerotis. Mag. 5.0				ν Geminorum. Mag. 4.1				8 Lyncis. Mag. 6.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	6 22		−52 38		6 23		− 4 42		6 24		+20 15		6 30		+61 32	
	s		″		s		″		s		″		s		″	
Jan. 0.5	11.946		69.67		60.009		45.19		11.868		47.54		22.24		70.59	
10.5	11.925	21	73.18	351	60.072	63	46.91	172	11.951	83	47.32	22	22.36	12	72.75	216
20.4	11.832	93	76.47	329	60.088	16	48.46	155	11.982	31	47.19	13	22.39	3	74.91	216
30.4	11.672	160	79.45	298	60.057	31	49.84	138	11.962	20	47.13	6	22.32	7	76.97	206
Feb. 9.4	11.451	221	82.04	259	59.982	75	50.99	115	11.893	69	47.14	1	22.15	17	78.85	188
19.4	11.178	273	84.18	214	59.867	115	51.93	94	11.782	111	47.18	4	21.90	25	80.47	162
Mar. 1.3	10.863	315	85.85	167	59.722	145	52.63	70	11.637	145	47.24	6	21.59	31	81.76	129
11.3	10.519	344	87.01	116	59.553	169	53.12	49	11.465	172	47.29	5	21.23	36	82.67	91
21.3	10.160	359	87.64	63	59.372	181	53.36	24	11.281	184	47.32	3	20.84	39	83.15	48
31.2	9.798	362	87.74	10	59.189	183	53.39	3	11.094	187	47.32	0	20.44	40	83.19	4
Apr. 10.2	9.446	352	87.33	41	59.014	175	53.20	19	10.914	180	47.28	4	20.06	38	82.80	39
20.2	9.115	331	86.42	91	58.855	159	52.80	40	10.753	161	47.22	6	19.70	36	81.99	81
30.2	8.817	298	85.03	139	58.720	135	52.20	60	10.618	135	47.14	8	19.40	30	80.80	119
May 10.1	8.560	257	83.20	183	58.617	103	51.40	80	10.518	100	47.05	9	19.16	24	79.28	152
20.1	8.351	209	80.97	223	58.550	67	50.42	98	10.456	62	46.97	8	18.98	18	77.50	178
30.1	8.198	153	78.41	256	58.521	29	49.27	115	10.436	20	46.91	6	18.88	10	75.50	200
June 9.1	8.103	95	75.58	283	58.530	9	47.99	128	10.459	23	46.89	2	18.86	2	73.35	215
19.0	8.067	36	72.53	305	58.578	48	46.60	139	10.524	65	46.90	1	18.92	6	71.13	222
29.0	8.093	26	69.37	316	58.664	86	45.13	147	10.630	106	46.95	5	19.06	14	68.89	224
July 9.0	8.179	86	66.17	320	58.787	123	43.63	150	10.772	142	47.04	9	19.29	23	66.68	221
18.9	8.325	146	63.03	314	58.941	154	42.15	148	10.950	178	47.15	11	19.58	29	64.57	211
28.9	8.524	199	60.05	298	59.124	183	40.73	142	11.158	208	47.27	12	19.93	35	62.57	200
Aug. 7.9	8.774	250	57.30	275	59.334	210	39.44	129	11.391	233	47.39	12	20.34	41	60.75	182
17.9	9.069	295	54.91	239	59.564	230	38.33	111	11.647	256	47.47	8	20.80	46	59.14	161
27.8	9.402	333	52.95	196	59.812	248	37.43	90	11.920	273	47.50	3	21.30	50	57.75	139
Sept. 6.8	9.768	366	51.50	145	60.076	264	36.82	61	12.207	287	47.47	3	21.83	53	56.61	114
16.8	10.156	388	50.62	88	60.350	274	36.51	31	12.505	298	47.35	12	22.39	56	55.74	87
26.8	10.560	404	50.35	27	60.631	281	36.53	2	12.811	306	47.13	22	22.96	57	55.17	57
Oct. 6.7	10.968	408	50.72	37	60.916	285	36.90	37	13.121	310	46.81	32	23.54	58	54.90	27
16.7	11.370	402	51.75	103	61.201	285	37.60	70	13.431	310	46.40	41	24.12	58	54.93	3
26.7	11.759	389	53.38	163	61.482	281	38.64	104	13.735	304	45.92	48	24.70	58	55.29	36
Nov. 5.6	12.121	362	55.58	220	61.753	271	39.95	131	14.032	297	45.37	55	25.25	55	55.98	69
15.6	12.447	326	58.28	270	62.009	256	41.50	155	14.314	282	44.83	54	25.77	52	56.97	99
25.6	12.727	280	61.38	310	62.244	235	43.22	172	14.576	262	44.28	55	26.25	48	58.29	132
Dec. 5.6	12.952	225	64.78	340	62.451	207	45.06	184	14.808	232	43.76	52	26.67	42	59.88	159
15.5	13.114	162	68.37	359	62.624	173	46.94	188	15.006	198	43.30	46	27.02	35	61.70	182
25.5	13.208	94	72.01	364	62.757	133	48.80	186	15.163	157	42.91	39	27.28	26	63.72	202
35.5	13.232	24	75.60	359	62.847	90	50.58	178	15.273	110	42.65	26	27.46	18	65.87	215
Mean Place	9.229		63.89		57.646		39.69		9.231		52.52		17.588		75.02	
Sec δ, Tan δ	1.649		−1.311		1.003		−0.082		1.066		+0.368		2.099		+1.846	
$D_\psi\alpha$, $D_\omega\alpha$	+0.03		−0.01		+0.06		0.00		+0.07		0.00		+0.11		+0.02	
$D_\psi\delta$, $D_\omega\delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		−0.1		[illegible]	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ² Canis Majoris. Mag. 4.5				23 H. Camelop. Mag. 5.6				γ Geminorum. Mag. 1.9				51 Aurigæ. Mag. 5.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	6 31		−22 53		6 32		+79 38		6 33		+16 27		6 33		+39 27	
	s		″		s		″		s		″		s		″	
Jan. 0.5	42.054		62.96		37.03		74.83		4.571		64.69		5.989		43.63	
		52		266		19		291		89		49		105		94
10.5	42.106		65.62		37.22	—	77.74		4.660		64.20		6.094		44.57	
		2		246		7		287		38		37		42		100
20.4	42.108	—	68.08		37.15		80.61		4.698	—	63.83		6.136	—	45.57	
		47		222		31		273		13		26		19		100
30.4	42.061		70.30		36.84		83.34		4.685		63.57		6.117		46.57	
		94		193		54		246		60		17		79		96
Feb. 9.4	41.967		72.23		36.30		85.80		4.625		63.40		6.038		47.53	
		135		159		74		211		104		11		131		85
19.4	41.832		73.82		35.56		87.91		4.521		63.29		5.907		48.38	
		169		123		92		166		138		4		174		70
Mar. 1.3	41.663		75.05		34.64		89.57		4.383		63.25		5.733		49.08	
		191		87		103		116		164		2		207		52
11.3	41.472		75.92		33.61		90.73		4.219		63.23	—	5.526		49.60	
		206		50		110		62		179		1		226		29
21.3	41.266		76.42		32.51		91.35		4.040		63.24		5.300		49.89	
		209		10		113		3		183		2		231		7
31.2	41.057		76.52	—	31.38		91.38	—	3.857		63.26		5.069		49.96	—
		204		25		110		52		177		2		223		17
Apr. 10.2	40.853		76.27		30.28		90.86		3.680		63.28		4.846		49.79	
		187		61		104		106		160		3		203		39
20.2	40.666		75.66		29.24		89.80		3.520		63.31		4.643		49.40	
		163		94		91		155		136		4		172		58
30.2	40.503		74.72		28.33		88.25		3.384		63.35		4.471		48.82	
		133		128		78		199		104		7		134		77
May 10.1	40.370		73.44		27.55		86.26		3.280		63.42		4.337		48.05	
		99		157		60		233		66		9		88		89
20.1	40.271		71.87		26.95		83.93		3.214		63.51		4.249		47.16	
		60		181		39		264		28		14		39		99
30.1	40.211		70.06		26.56		81.29		3.186	—	63.65		4.210	—	46.17	
		18		203		20		282		15		17		11		106
June 9.1	40.193	—	68.03		26.36	—	78.47		3.201		63.82		4.221		45.11	
		23		219		2		295		55		23		62		109
19.0	40.216		65.84		26.38		75.52		3.256		64.05		4.283		44.02	
		63		230		22		298		93		26		112		109
29.0	40.279		63.54		26.60		72.54		3.349		64.31		4.395		42.93	
		102		233		43		294		131		28		158		107
July 9.0	40.381		61.21		27.03		69.60		3.480		64.59		4.553		41.86	
		137		230		63		284		165		29		200		101
18.9	40.518		58.91		27.66		66.76		3.645		64.88		4.753		40.85	
		171		221		80		266		194		29		237		96
28.9	40.689		56.70		28.46		64.10		3.839		65.17		4.990		39.89	
		201		201		97		244		221		25		271		89
Aug. 7.9	40.890		54.69		29.43		61.66		4.060		65.42		5.261		39.00	
		227		177		110		215		242		20		299		80
17.9	41.117		52.92		30.53		59.51		4.302		65.62		5.560		38.20	
		250		144		122		185		263		12		322		71
27.8	41.367		51.48		31.75		57.66		4.565		65.74		5.882		37.49	
		267		106		133		148		276		2		341		64
Sept. 6.8	41.634		50.42		33.08		56.18		4.841		65.76	—	6.223		36.85	
		281		62		140		110		289		11		357		55
16.8	41.915		49.80		34.48		55.08		5.130		65.65		6.580		36.30	
		292		16		145		69		297		25		366		46
26.8	42.207		49.64	—	35.93		54.39		5.427		65.40		6.946		35.84	
		297		35		147		26		303		37		372		36
Oct. 6.7	42.504		49.99		37.40		54.13	—	5.730		65.03		7.318		35.48	
		297		84		146		18		304		51		375		25
16.7	42.801		50.83		38.86		54.31		6.034		64.52		7.693		35.23	
		293		131		144		63		301		61		372		13
26.7	43.094		52.14		40.30		54.94		6.335		63.91		8.065		35.10	
		282		175		136		107		296		73		361		0
Nov. 5.6	43.376		53.89		41.66		56.01		6.631		63.18		8.426		35.10	
		264		212		127		149		282		77		344		16
15.6	43.640		56.01		42.93		57.50		6.913		62.41		8.770		35.26	
		242		241		114		189		261		78		319		32
25.6	43.882		58.42		44.07		59.39		7.174		61.63		9.089		35.58	
		209		264		99		226		235		77		287		47
Dec. 5.6	44.091		61.06		45.06		61.65		7.409		60.86		9.376		36.05	
		172		275		78		255		201		71		244		65
15.5	44.263		63.81		45.84		64.20		7.610		60.15		9.620		36.70	
		129		278		57		276		162		64		195		78
25.5	44.392		66.59		46.41		66.96		7.772		59.51		9.815		37.48	
		81		272		32		290		115		54		138		90
35.5	44.473		69.31		46.73		69.86		7.887		58.97		9.953		38.38	
Mean Place	39.717		57.30		26.159		79.04		1.997		70.22		2.854		48.82	
Sec δ, Tan δ	1.086		−0.422		5.568		+5.477		1.043		+0.296		1.295		+0.823	
Dψα, Dωα	+0.05		0.00		+0.20		+0.05		+0.07		0.00		+0.08		+0.01	
δ, Dωδ	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Argus. Mag. 3.2				S Monocerotis. Mag. 4.7				ε Geminorum. Mag. 3.2				ξ Geminorum. Mag. 3.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 6 35		° ′ −43 7		h m 6 36		° ′ + 9 58		h m 6 38		° ′ +25 12		h m 6 40		° ′ +12 58	
	s		″		s		″		s		″		s		″	
Jan. 0.5	19.572	25	33.13	338	33.541	87	12.40	89	59.704	101	39.35	5	47.156	93	56.64	72
10.5	19.597	36	36.51	319	33.628	38	11.51	77	59.805	46	39.40	15	47.249	43	55.92	60
20.4	19.561	97	39.70	289	33.666	12	10.74	62	59.851	7	39.55	23	47.292	7	55.32	47
30.4	19.464	151	42.59	255	33.654	58	10.12	50	59.844	58	39.78	27	47.285	54	54.85	36
Feb. 9.4	19.313	199	45.14	214	33.596	99	9.62	38	59.786	104	40.05	29	47.231	97	54.49	24
19.4	19.114	237	47.28	169	33.497	135	9.24	25	59.682	142	40.34	27	47.134	133	54.25	16
Mar. 1.3	18.877	266	48.97	123	33.362	160	8.99	17	59.540	171	40.61	21	47.001	160	54.09	9
11.3	18.611	282	50.20	73	33.202	174	8.82	7	59.369	189	40.82	15	46.841	175	54.00	3
21.3	18.329	287	50.93	24	33.028	180	8.75	0	59.180	194	40.97	7	46.666	180	53.97	2
31.3	18.042	281	51.17	25	32.848	174	8.75	7	58.986	188	41.04	1	46.486	176	53.99	6
Apr. 10.2	17.761	264	50.92	71	32.674	158	8.82	15	58.798	171	41.03	9	46.310	160	54.05	9
20.2	17.497	238	50.21	118	32.516	135	8.97	23	58.627	147	40.94	17	46.150	138	54.14	15
30.2	17.259	204	49.03	159	32.381	104	9.20	29	58.480	113	40.77	24	46.012	107	54.29	19
May 10.1	17.055	164	47.44	198	32.277	69	9.49	37	58.367	75	40.53	26	45.905	72	54.48	24
20.1	16.891	117	45.46	231	32.208	31	9.86	44	58.292	34	40.27	29	45.833	33	54.72	29
30.1	16.774	71	43.15	259	32.177	9	10.30	52	58.258	10	39.98	30	45.800	6	55.01	35
June 9.1	16.703	20	40.56	279	32.186	47	10.82	57	58.268	53	39.68	29	45.806	45	55.36	40
19.0	16.683	30	37.77	293	32.233	87	11.39	62	58.321	93	39.39	27	45.851	84	55.76	43
29.0	16.713	80	34.84	299	32.320	122	12.01	65	58.414	134	39.12	25	45.935	120	56.19	46
July 9.0	16.793	127	31.85	296	32.442	155	12.66	66	58.548	170	38.87	22	46.055	154	56.65	47
19.0	16.920	173	28.89	284	32.597	183	13.32	63	58.718	201	38.65	22	46.209	183	57.12	44
28.9	17.093	213	26.05	261	32.780	211	13.95	57	58.919	229	38.43	21	46.392	210	57.56	40
Aug. 7.9	17.306	251	23.44	231	32.991	232	14.52	47	59.148	254	38.22	24	46.602	232	57.96	31
17.9	17.557	282	21.13	192	33.223	252	14.99	35	59.402	274	37.98	24	46.834	253	58.27	20
27.8	17.839	309	19.21	145	33.475	266	15.34	18	59.676	290	37.74	28	47.087	267	58.47	8
Sept. 6.8	18.148	330	17.76	91	33.741	279	15.52	1	59.966	305	37.46	33	47.354	281	58.55	8
16.8	18.478	345	16.85	34	34.020	286	15.53	19	60.271	315	37.13	37	47.635	290	58.47	25
26.8	18.823	353	16.51	26	34.306	294	15.34	39	60.586	320	36.76	42	47.925	297	58.22	42
Oct. 6.7	19.176	352	16.77	89	34.600	296	14.95	59	60.906	324	36.34	45	48.222	299	57.80	58
16.7	19.528	344	17.66	148	34.896	294	14.36	77	61.230	322	35.89	48	48.521	299	57.22	75
26.7	19.872	328	19.14	202	35.190	287	13.59	92	61.552	315	35.41	49	48.820	292	56.47	85
Nov. 5.7	20.200	302	21.16	251	35.477	274	12.67	103	61.867	301	34.92	46	49.112	281	55.62	95
15.6	20.502	268	23.67	291	35.751	255	11.64	111	62.168	282	34.46	40	49.393	261	54.67	99
25.6	20.770	226	26.58	320	36.006	230	10.53	113	62.450	254	34.06	33	49.654	237	53.68	98
Dec. 5.6	20.996	176	29.78	339	36.236	197	9.40	111	62.704	219	33.73	22	49.891	204	52.70	96
15.5	21.172	121	33.17	348	36.433	158	8.29	105	62.923	178	33.51	11	50.095	164	51.74	89
25.5	21.293	62	36.65	344	36.591	113	7.24	95	63.101	129	33.40	1	50.259	120	50.85	78
35.5	21.355		40.09		36.704		6.29		63.230		33.39		50.379		50.07	
Mean Place	17.056		27.75		31.054		18.15		56.975		45.15		44.633		62.57	
Sec δ, Tan δ	1.370		−0.937		1.015		+0.176		1.105		+0.471		1.026		+0.230	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.04		−0.01		+0.07		0.00		+0.07		+0.01		+0.07		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ⁵ Aurigæ. Mag. 5.3				α Canis Majoris. (*Sirius.*) Mag. −1.6				18 Monocerotis. Mag. 4.7				43 Camelop. Mag. 5.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	6 40		+43 39		6 41		−16 36		6 43		+ 2 29		6 44		+68 58	
	s		″		s		″		s		″		s		″	
Jan. 0.5	57.576	119	28.10	119	36.911	65	21.79	243	40.631	88	60.63	137	64.67	18	58.58	249
10.5	57.695	52	29.29	125	36.976	15	24.22	226	40.719	40	59.26	121	64.85	5	61.07	251
20.4	57.747	— 13	30.54	125	36.991	— 35	26.48	201	40.759	— 9	58.05	106	64.90	— 8	63.58	243
30.4	57.734	77	31.79	118	36.956	80	28.49	174	40.750	55	56.99	88	64.82	22	66.01	225
Feb. 9.4	57.657	134	32.97	107	36.876	120	30.23	146	40.695	96	56.11	69	64.60	31	68.26	197
19.4	57.523	183	34.04	90	36.756	155	31.69	112	40.599	132	55.42	52	64.29	40	70.23	161
Mar. 1.3	57.340	218	34.94	67	36.601	178	32.81	80	40.467	157	54.90	36	63.89	48	71.84	120
11.3	57.122	239	35.61	43	36.423	192	33.61	48	40.310	173	54.54	18	63.41	52	73.04	73
21.3	56.883	248	36.04	15	36.231	198	34.09	14	40.137	178	54.36	4	62.89	54	73.77	23
31.3	56.635	243	36.19	— 13	36.033	192	34.23	— 18	39.959	174	54.32	— 11	62.35	53	74.00	— 26
Apr. 10.2	56.392	221	36.06	38	35.841	178	34.05	47	39.785	161	54.43	26	61.82	50	73.74	73
20.2	56.171	193	35.68	64	35.663	154	33.58	79	39.624	138	54.69	39	61.32	45	73.01	120
30.2	55.978	152	35.04	84	35.509	125	32.79	106	39.486	109	55.08	53	60.87	37	71.81	159
May 10.1	55.826	106	34.20	103	35.384	92	31.73	130	39.377	76	55.61	66	60.50	28	70.22	191
20.1	55.720	54	33.17	117	35.292	54	30.43	153	39.301	39	56.27	77	60.22	19	68.31	221
30.1	55.666	0	32.00	126	35.238	14	28.90	173	39.262	2	57.04	88	60.03	9	66.10	239
June 9.1	55.666	54	30.74	131	35.224	— 25	27.17	186	39.260	— 37	57.92	96	59.94	— 2	63.71	252
19.0	55.720	105	29.43	134	35.249	63	25.31	196	39.297	75	58.88	102	59.96	12	61.19	259
29.0	55.825	156	28.09	131	35.312	101	23.35	199	39.372	109	59.90	106	60.08	24	58.60	256
July 9.0	55.981	201	26.78	127	35.413	135	21.36	197	39.481	142	60.96	105	60.32	32	56.04	251
19.0	56.182	242	25.51	122	35.548	167	19.39	188	39.623	172	62.01	100	60.64	41	53.53	239
28.9	56.424	277	24.29	112	35.715	194	17.51	171	39.795	197	63.01	91	61.05	50	51.14	222
Aug. 7.9	56.701	310	23.17	104	35.909	220	15.80	150	39.992	221	63.92	79	61.55	56	48.92	200
17.9	57.011	335	22.13	94	36.129	241	14.30	120	40.213	241	64.71	60	62.11	62	46.92	175
27.8	57.346	357	21.19	82	36.370	259	13.10	86	40.454	257	65.31	39	62.73	67	45.17	148
Sept. 6.8	57.703	374	20.37	70	36.629	272	12.24	48	40.711	270	65.70	14	63.40	72	43.69	116
16.8	58.077	387	19.67	57	36.901	283	11.76	4	40.981	280	65.84	— 13	64.12	74	42.53	82
26.8	58.464	395	19.10	44	37.184	289	11.72	— 41	41.261	287	65.71	39	64.86	76	41.71	48
Oct. 6.7	58.859	399	18.66	28	37.473	290	12.13	85	41.548	290	65.32	68	65.62	76	41.23	10
16.7	59.258	395	18.38	13	37.763	288	12.98	128	41.838	289	64.64	91	66.38	75	41.13	— 29
26.7	59.653	387	18.25	— 5	38.051	278	14.26	166	42.127	283	63.73	115	67.13	73	41.42	67
Nov. 5.7	60.040	370	18.30	25	38.329	263	15.92	201	42.410	272	62.58	134	67.86	68	42.09	105
15.6	60.410	343	18.55	44	38.592	242	17.93	225	42.682	252	61.24	146	68.54	63	43.14	141
25.6	60.753	310	18.99	65	38.834	213	20.18	242	42.934	229	59.78	153	69.17	56	44.55	176
Dec. 5.6	61.063	267	19.64	82	39.047	178	22.60	254	43.163	196	58.25	156	69.73	47	46.31	205
15.5	61.330	214	20.46	100	39.225	137	25.14	256	43.359	158	56.69	151	70.20	37	48.36	229
25.5	61.544	154	21.46	114	39.362	92	27.70	249	43.517	114	55.18	141	70.57	24	50.65	244
35.5	61.698		22.60		39.454		30.19		43.631		53.77		70.81		53.09	
Mean Place	54.280		33.91		34.720		15.03		38.219		66.60		58.824		64.44	
Sec δ, Tan δ	1.382		+0.954		1.044		−0.298		1.001		+0.044		2.788		+2.603	
$D_\psi a$, $D_\omega a$	+0.09		+0.01		+0.05		0.00		+0.06		0.00		+0.13		+0.03	
$D_\psi \delta$, $D_\omega \delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Pictoris. Mag. 3.3				θ Geminorum. Mag. 3.6				τ Argus. Mag. 2.8				15 Lyncis. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	6 47		−61 51		6 47		+34 3		6 47		−50 30		6 50		+58 31	
	s		″		s		″		s		″		s		″	
Jan. 0.5	24.90		20.07		30.101		30.31		58.254		69.58		20.486		43.63	
		2		372		118		58		27		360		155		198
10.5	24.88		23.79		30.219		30.89		58.281	—	73.18		20.641		45.61	
		11		355		59		68		44		341		63		203
20.5	24.77		27.34		30.278	—	31.57		58.237		76.59		20.704	—	47.64	
		20		329		1		74		111		315		26		200
30.4	24.57		30.63		30.277		32.31		58.126		79.74		20.678		49.64	
		27		294		57		73		174		282		114		188
Feb. 9.4	24.30		33.57		30.220		33.04		57.952		82.56		20.564		51.52	
		34		253		108		69		229		240		192		168
19.4	23.96		36.10		30.112		33.73		57.723		84.96		20.372		53.20	
		39		205		152		61		274		195		258		141
Mar. 1.3	23.57		38.15		29.960		34.34		57.449		86.91		20.114		54.61	
		44		156		183		49		308		147		309		106
11.3	23.13		39.71		29.777		34.83		57.141		88.38		19.805		55.67	
		47		104		204		34		329		96		342		69
21.3	22.66		40.75		29.573		35.17		56.812		89.34		19.463		56.36	
		48		49		212		16		338		43		356		28
31.3	22.18		41.24	—	29.361		35.33	—	56.474		89.77	—	19.107		56.64	—
		48		5		208		2		335		7		352		14
Apr. 10.2	21.70		41.19		29.153		35.31		56.139		89.70		18.755		56.50	
		46		56		193		20		319		57		330		54
20.2	21.24		40.63		28.960		35.11		55.820		89.13		18.425		55.96	
		43		107		165		35		293		106		292		91
30.2	20.81		39.56		28.795		34.76		55.527		88.07		18.133		55.05	
		38		156		132		49		259		152		242		125
May 10.2	20.43		38.00		28.663		34.27		55.268		86.55		17.891		53.80	
		33		199		93		62		216		193		180		154
20.1	20.10		36.01		28.570		33.65		55.052		84.62		17.711		52.26	
		27		238		47		70		168		229		114		177
30.1	19.83		33.63		28.523		32.95		54.884		82.33		17.597		50.49	
		20		272		0		76		116		262		42		194
June 9.1	19.63		30.91		28.523		32.19		54.768		79.71		17.555	—	48.55	
		13		298		46		79		60		284		31		206
19.0	19.50		27.93		28.569		31.40		54.708		76.87		17.586		46.49	
		4		315		91		80		2		303		102		213
29.0	19.46	—	24.78		28.660		30.60		54.706	—	73.84		17.688		44.36	
		3		324		134		80		52		310		173		213
July 9.0	19.49		21.54		28.794		29.80		54.758		70.74		17.861		42.23	
		10		324		173		78		108		310		237		208
19.0	19.59		18.30		28.967		29.02		54.866		67.64		18.098		40.15	
		17		315		210		74		162		299		297		200
28.9	19.76		15.15		29.177		28.28		55.028		64.65		18.395		38.15	
		25		294		240		72		212		280		350		188
Aug. 7.9	20.01		12.21		29.417		27.56		55.240		61.85		18.745		36.27	
		32		264		269		67		258		250		396		171
17.9	20.33		9.57		29.686		26.89		55.498		59.35		19.141		34.56	
		37		225		291		65		299		212		437		154
27.9	20.70		7.32		29.977		26.24		55.797		57.23		19.578		33.02	
		42		177		312		62		333		165		471		133
Sept. 6.8	21.12		5.55		30.289		25.62		56.130		55.58		20.049		31.69	
		47		121		327		59		361		111		498		108
16.8	21.59		4.34		30.616		25.03		56.491		54.47		20.547		30.61	
		49		60		339		55		381		51		520		84
26.8	22.08		3.74	—	30.955		24.48		56.872		53.96	—	21.067		29.77	
		51		6		348		51		393		11		531		57
Oct. 6.7	22.59		3.80		31.303		23.97		57.265		54.07		21.598		29.20	
		51		71		353		46		396		76		538		27
16.7	23.10		4.51		31.656		23.51		57.661		54.83		22.136		28.93	—
		49		137		351		38		389		139		535		2
26.7	23.59		5.88		32.007		23.13		58.050		56.22		22.671		28.95	
		47		198		346		30		371		197		523		33
Nov. 5.7	24.06		7.86		32.353		22.83		58.421		58.19		23.194		29.28	
		42		253		333		18		343		250		499		66
15.6	24.48		10.39		32.686		22.65		58.764		60.69		23.693		29.94	
		37		300		311		6		305		295		464		96
25.6	24.85		13.39		32.997		22.59	—	59.069		63.64		24.157		30.90	
		30		335		284		8		256		328		417		127
Dec. 5.6	25.15		16.74		33.281		22.67		59.325		66.92		24.574		32.17	
		22		362		245		25		200		352		357		154
15.6	25.37		20.36		33.526		22.92		59.525		70.44		24.931		33.71	
		14		374		201		39		136		364		285		175
25.5	25.51		24.10		33.727		23.31		59.661		74.08		25.216		35.46	
		4		376		148		53		69		364		203		193
35.5	25.55		27.86		33.875		23.84		59.730		77.72		25.419		37.39	
Mean Place	21.711		15.66		27.161		36.69		55.561		64.85		16.215		50.18	
Sec δ, Tan δ	2.120		−1.869		1.207		+0.676		1.573		−1.214		1.915		+1.634	
$D_\psi a$, $D_\omega a$	+0.01		−0.03		+0.08		+0.01		+0.03		−0.02		+0.10		+0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Canis Majoris. Mag. 4.2				ε Canis Majoris. Mag. 1.6				ζ Geminorum. Var. 3.7–4.3				o^2 Canis Majoris. Mag. 3.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	6 50		−11 56		6 55		−28 51		6 59		+20 41		6 59		−23 42	
	s		″		s		″		s		″		s		″	
Jan. 0.5	27.962	83	15.82	219	28.903	72	44.92	298	20.992	118	17.80	29	40.876	82	55.97	279
10.5	28.045	34	18.01	203	28.975	18	47.90	283	21.110	66	17.51	15	40.958	30	58.76	261
20.5	28.079	— 16	20.04	183	28.993	— 35	50.73	258	21.176	13	17.36	4	40.988	— 21	61.37	241
30.4	28.063	62	21.87	157	28.958	85	53.31	230	21.189	— 38	17.32	— 6	40.967	71	63.78	212
Feb. 9.4	28.001	103	23.44	132	28.873	130	55.61	194	21.151	86	17.38	12	40.896	115	65.90	180
19.4	27.898	138	24.76	102	28.743	168	57.55	156	21.065	126	17.50	17	40.781	152	67.70	145
Mar. 1.3	27.760	166	25.78	74	28.575	195	59.11	117	20.939	156	17.67	17	40.629	180	69.15	108
11.3	27.594	181	26.52	45	28.380	215	60.28	77	20.783	175	17.84	17	40.449	198	70.23	71
21.3	27.413	188	26.97	16	28.165	222	61.05	34	20.608	185	18.01	14	40.251	207	70.94	33
31.3	27.225	185	27.13	— 12	27.943	220	61.39	— 6	20.423	183	18.15	10	40.044	206	71.27	— 4
Apr. 10.2	27.040	172	27.01	39	27.723	207	61.33	45	20.240	170	18.25	5	39.838	195	71.23	42
20.2	26.868	152	26.62	66	27.516	188	60.88	85	20.070	150	18.30	1	39.643	176	70.81	76
30.2	26.716	124	25.96	90	27.328	159	60.03	121	19.920	121	18.31	— 2	39.467	149	70.05	110
May 10.2	26.592	93	25.06	114	27.169	127	58.82	156	19.799	86	18.29	4	39.318	116	68.95	140
20.1	26.499	57	23.92	133	27.042	90	57.26	183	19.713	49	18.25	5	39.202	81	67.55	167
30.1	26.442	19	22.59	151	26.952	50	55.43	210	19.664	8	18.20	6	39.121	44	65.88	190
June 9.1	26.423	— 19	21.08	166	26.902	8	53.33	229	19.656	— 32	18.14	5	39.077	4	63.98	210
19.0	26.442	56	19.42	174	26.894	— 33	51.04	243	19.688	71	18.09	5	39.073	— 36	61.88	222
29.0	26.498	92	17.68	179	26.927	73	48.61	250	19.759	110	18.04	4	39.109	74	59.66	230
July 9.0	26.590	127	15.89	178	27.000	111	46.11	250	19.869	143	18.00	4	39.183	111	57.36	228
19.0	26.717	157	14.11	171	27.111	148	43.61	242	20.012	176	17.96	6	39.294	145	55.08	222
28.9	26.874	184	12.40	157	27.259	181	41.19	225	20.188	204	17.90	8	39.439	177	52.86	206
Aug. 7.9	27.058	211	10.83	139	27.440	212	38.94	201	20.392	229	17.82	13	39.616	205	50.80	184
17.9	27.269	231	9.44	112	27.652	238	36.93	168	20.621	252	17.69	20	39.821	230	48.96	154
27.9	27.500	251	8.32	82	27.890	263	35.25	128	20.873	269	17.49	27	40.051	254	47.42	117
Sept. 6.8	27.751	265	7.50	47	28.153	282	33.97	84	21.142	286	17.22	36	40.305	271	46.25	75
16.8	28.016	278	7.03	8	28.435	295	33.13	33	21.428	298	16.86	45	40.576	286	45.50	28
26.8	28.294	286	6.95	— 33	28.730	308	32.80	— 19	21.726	309	16.41	55	40.862	297	45.22	— 22
Oct. 6.7	28.580	290	7.28	74	29.038	311	32.99	73	22.035	314	15.86	64	41.159	302	45.44	71
16.7	28.870	289	8.02	113	29.349	310	33.72	126	22.349	316	15.22	72	41.461	302	46.15	120
26.7	29.159	283	9.15	148	29.659	301	34.98	174	22.665	312	14.50	75	41.763	297	47.35	166
Nov. 5.7	29.442	271	10.63	179	29.960	287	36.72	218	22.977	303	13.75	77	42.060	283	49.01	207
15.6	29.713	252	12.42	205	30.247	264	38.90	253	23.280	287	12.98	74	42.343	262	51.08	238
25.6	29.965	227	14.47	220	30.511	235	41.43	280	23.567	262	12.24	68	42.605	235	53.46	265
Dec. 5.6	30.192	193	16.67	229	30.746	195	44.23	298	23.829	231	11.56	60	42.840	200	56.11	279
15.6	30.385	153	18.96	231	30.941	151	47.21	306	24.060	192	10.96	48	43.040	158	58.90	286
25.5	30.538	109	21.27	225	31.092	102	50.27	302	24.252	145	10.48	36	43.198	110	61.76	283
35.5	30.647		23.52		31.194		53.29		24.397		10.12		43.308		64.59	
Mean Place	25.623		10.00		26.532		39.69		18.369		24.79		38.530		50.58	
Sec δ, Tan δ	1.022		−0.212		1.142		−0.551		1.069		+0.378		1.092		−0.439	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		0.00		+0.05		−0.01		+0.07		+0.01		+0.05		−0.01	
$D_\psi\delta$, $D_\omega\delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

Washington Mean Time.	γ Canis Majoris. Mag. 4.1				δ Canis Majoris. Mag. 2.0				63 Aurigæ. Mag. 5.1				51 Geminorum. Mag. 5.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	7 0		−15 30		7 5		−26 15		7 6		+39 26		7 8		+16 17	
	s		″		s		″		s		″		s		″	
Jan. 0.5	7.983	90	51.43	240	8.165	85	54.78	291	8.338	144	66.41	86	45.855	124	43.73	60
10.5	8.073	40	53.83	225	8.250	32	57.69	277	8.482	84	67.27	98	45.979	73	43.13	45
20.5	8.113	10	56.08	203	8.282	20	60.46	253	8.566	19	68.25	105	46.052	21	42.68	31
30.4	8.103	58	58.11	179	8.262	71	62.99	225	8.585	44	69.30	107	46.073	30	42.37	17
Feb. 9.4	8.045	101	59.90	149	8.191	116	65.24	191	8.541	101	70.37	101	46.043	76	42.20	8
19.4	7.944	137	61.39	119	8.075	154	67.15	158	8.440	149	71.38	91	45.967	116	42.12	1
Mar. 1.4	7.807	165	62.58	88	7.921	183	68.73	119	8.291	187	72.29	75	45.851	147	42.13	7
11.3	7.642	183	63.46	56	7.738	202	69.92	79	8.104	214	73.04	57	45.704	169	42.20	10
21.3	7.459	191	64.02	24	7.536	213	70.71	41	7.890	226	73.61	34	45.535	179	42.30	12
31.3	7.268	190	64.26	6	7.323	212	71.12	1	7.664	227	73.95	11	45.356	178	42.42	13
Apr. 10.2	7.078	179	64.20	37	7.111	201	71.13	38	7.437	213	74.06	13	45.178	166	42.55	13
20.2	6.899	158	63.83	67	6.910	183	70.75	75	7.224	190	73.93	35	45.012	150	42.68	12
30.2	6.741	134	63.16	93	6.727	157	70.00	110	7.034	156	73.58	56	44.862	122	42.80	13
May 10.2	6.607	103	62.23	119	6.570	126	68.90	141	6.878	116	73.02	74	44.740	91	42.93	14
20.1	6.504	67	61.04	141	6.444	91	67.49	171	6.762	72	72.28	88	44.649	54	43.07	14
30.1	6.437	31	59.63	163	6.353	52	65.78	196	6.690	24	71.40	99	44.595	17	43.21	16
June 9.1	6.406	7	58.00	176	6.301	13	63.82	216	6.666	24	70.41	107	44.578	24	43.37	18
19.1	6.413	44	56.24	188	6.288	28	61.66	230	6.690	72	69.34	113	44.602	61	43.55	19
29.0	6.457	81	54.36	193	6.316	66	59.36	237	6.762	118	68.21	116	44.663	95	43.74	19
July 9.0	6.538	115	52.43	193	6.382	103	56.99	238	6.880	161	67.05	115	44.758	131	43.93	18
19.0	6.653	146	50.50	186	6.485	138	54.61	232	7.041	201	65.90	114	44.889	163	44.11	16
28.9	6.799	177	48.64	172	6.623	172	52.29	215	7.242	235	64.76	111	45.052	190	44.27	11
Aug. 7.9	6.976	204	46.92	153	6.795	202	50.14	194	7.477	268	63.65	107	45.242	215	44.38	5
17.9	7.180	226	45.39	126	6.997	228	48.20	163	7.745	295	62.58	101	45.457	238	44.43	5
27.9	7.406	246	44.13	94	7.225	253	46.57	126	8.040	318	61.57	96	45.695	257	44.38	17
Sept. 6.8	7.652	264	43.19	56	7.478	272	45.31	83	8.358	339	60.61	89	45.952	273	44.21	30
16.8	7.916	278	42.63	15	7.750	289	44.48	35	8.697	357	59.72	81	46.225	287	43.91	43
26.8	8.194	287	42.48	28	8.039	300	44.13	17	9.054	368	58.91	71	46.512	298	43.48	57
Oct. 6.8	8.481	293	42.76	73	8.339	307	44.30	68	9.422	375	58.20	61	46.810	306	42.91	72
16.7	8.774	294	43.49	114	8.646	308	44.98	119	9.797	379	57.59	49	47.116	309	42.19	83
26.7	9.068	290	44.63	154	8.954	302	46.17	166	10.176	376	57.10	35	47.425	306	41.36	92
Nov. 5.7	9.358	278	46.17	187	9.256	290	47.83	209	10.552	365	56.75	16	47.731	299	40.44	97
15.6	9.636	259	48.04	215	9.546	268	49.92	245	10.917	345	56.59	1	48.030	286	39.47	99
25.6	9.895	234	50.19	235	9.814	242	52.37	271	11.262	317	56.60	22	48.316	262	38.48	96
Dec. 5.6	10.129	201	52.54	247	10.056	205	55.08	288	11.579	280	56.82	42	48.578	233	37.52	89
15.6	10.330	161	55.01	250	10.261	162	57.96	296	11.859	232	57.24	61	48.811	195	36.63	79
25.5	10.491	116	57.51	246	10.423	115	60.92	295	12.091	179	57.85	80	49.006	151	35.84	66
35.5	10.607		59.97		10.538		63.87		12.270		58.65		49.157		35.18	
Mean Place	5.649		45.69		5.807		49.59		5.255		74.30		43.313		51.06	
Sec δ, Tan δ	1.038		−0.278		1.115		−0.494		1.295		+0.823		1.042		+0.292	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		0.00		+0.05		−0.01		+0.08		+0.02		+0.08		+0.01	
$D_\psi \delta$, $D_\omega \delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**γ² Volantis.** Mag. 3.9				**λ Geminorum.** Mag. 3.6				**π Argus.** Mag. 2.7				**δ Geminorum.** Mag. 3.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 7 9		° ′ −70 21		h m 7 13		° ′ +16 40		h m 7 14		° ′ −36 56		h m 7 15		° ′ +22 7	
	s		″		s		″		s		″		s		″	
Jan. 0.5	30.30		66.36		28.914		67.53		19.365		70.10		19.883		49.45	
10.5	30.30	0	70.18	382	29.043	129	66.94	59	19.451	86	73.43	333	20.018	135	49.22	23
20.5	30.17	13	73.88	370	29.120	77	66.51	43	19.478	27	76.63	320	20.101	83	49.12	10
30.4	29.92	25	77.37	349	29.146	26	66.22	29	19.446	32	79.60	297	20.130	29	49.16	4
Feb. 9.4	29.55	37	80.57	320	29.120	26	66.06	16	19.360	86	82.29	269	20.106	24	49.30	14
19.4	29.09	46	83.40	283	29.047	73	66.01	5	19.224	136	84.63	234	20.033	73	49.53	23
Mar. 1.4	28.54	55	85.80	240	28.933	114	66.04	3	19.046	178	86.57	194	19.917	116	49.79	26
11.3	27.93	61	87.72	192	28.789	144	66.13	9	18.834	212	88.09	152	19.769	148	50.06	27
21.3	27.27	66	89.12	142	28.621	168	66.25	12	18.600	234	89.16	107	19.597	172	50.32	26
31.3	26.59	68	90.01	89	28.443	178	66.39	14	18.354	246	89.78	62	19.413	184	50.53	21
Apr. 10.3	25.90	69	90.36	35	28.265	178	66.53	14	18.107	247	89.94	16	19.229	184	50.69	16
20.2	25.22	68	90.17	19	28.096	169	66.66	13	17.868	239	89.66	28	19.054	175	50.79	10
30.2	24.58	64	89.47	70	27.945	151	66.80	14	17.648	220	88.93	73	18.898	156	50.84	5
May 10.2	23.98	60	88.26	121	27.821	124	66.93	13	17.452	196	87.79	114	18.769	129	50.82	2
20.1	23.45	53	86.58	168	27.728	93	67.05	12	17.289	163	86.26	153	18.671	98	50.77	5
30.1	22.98	47	84.47	211	27.670	58	67.19	14	17.163	126	84.39	187	18.610	61	50.67	10
June 9.1	22.61	37	81.98	249	27.650	20	67.33	14	17.077	86	82.22	217	18.588	22	50.55	12
19.1	22.34	27	79.19	279	27.669	19	67.48	15	17.032	45	79.81	241	18.605	17	50.41	14
29.0	22.16	18	76.16	303	27.725	56	67.64	16	17.032	0	77.20	261	18.662	57	50.26	15
July 9.0	22.09	7	72.99	317	27.816	91	67.80.	16	17.075	43	74.49	271	18.756	94	50.10	16
19.0	22.13	4	69.76	323	27.943	127	67.95	15	17.161	86	71.75	274	18.886	130	49.91	19
29.0	22.28	15	66.56	320	28.101	158	68.07	12	17.288	127	69.07	268	19.048	162	49.71	20
Aug. 7.9	22.55	27	63.52	304	28.286	185	68.14	7	17.454	166	66.54	253	19.239	191	49.47	24
17.9	22.90	35	60.71	281	28.498	212	68.14	0	17.656	202	64.24	230	19.457	218	49.18	29
27.9	23.35	45	58.25	246	28.732	234	68.04	10	17.890	234	62.26	198	19.698	241	48.84	34
Sept. 6.8	23.88	53	56.22	203	28.987	255	67.83	21	18.155	265	60.68	158	19.961	263	48.42	42
16.8	24.47	59	54.72	150	29.259	272	67.50	33	18.444	289	59.58	110	20.241	280	47.93	49
26.8	25.12	65	53.82	90	29.545	286	67.03	47	18.755	311	59.00	58	20.537	296	47.34	59
Oct. 6.8	25.80	68	53.54	28	29.842	297	66.43	60	19.080	325	58.99	1	20.845	308	46.65	69
16.7	26.50	70	53.94	40	30.150	308	65.68	75	19.413	333	59.56	57	21.161	316	45.91	74
26.7	27.18	68	54.99	105	30.460	310	64.83	85	19.749	336	60.71	115	21.482	321	45.11	80
Nov. 5.7	27.83	65	56.68	169	30.769	309	63.89	94	20.079	330	62.41	170	21.803	321	44.28	83
15.7	28.43	60	58.96	228	31.071	302	62.91	98	20.394	315	64.61	220	22.117	314	43.45	83
25.6	28.96	53	61.76	280	31.360	289	61.91	100	20.686	292	67.23	262	22.415	298	42.67	78
Dec. 5.6	29.40	44	64.98	322	31.626	266	60.95	96	20.946	260	70.19	296	22.693	278	41.97	70
15.6	29.71	31	68.52	354	31.863	237	60.06	89	21.165	219	73.38	319	22.940	247	41.37	60
25.5	29.92	21	72.25	373	32.062	199	59.29	77	21.337	172	76.70	332	23.148	208	40.90	47
35.5	30.00	8	76.05	380	32.218	156	58.63	66	21.456	119	80.05	335	23.312	164	40.58	32
Mean Place	26.276		63.50		26.372		75.10		16.918		65.73		17.258		57.40	
Sec δ, Tan δ	2.977		−2.804		1.044		+0.300		1.251		−0.752		1.080		+0.407	
D$_{\psi}\alpha$, D$_{\omega}\alpha$	−0.01		−0.06		+0.07		+0.01		+0.04		−0.02		+0.07		+0.01	
D$_{\psi}\delta$, D$_{\omega}\delta$	−0.1		+1.0		−0.1		+0.9		−0.1		+0.9		−0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Volantis.				ι Geminorum.				η Canis Majoris.				Groombridge 1308.			
	Mag. 4.0				Mag. 3.9				Mag. 2.4				Mag. 5.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	7 16		−67 48		7 20		+27 57		7 20		−29 8		7 22		+68 37	
	s		″		s		″		s		″		s		″	
Jan. 0.5	56.64		35.09		44.625		28.27		55.888		44.20		33.63		48.85	
10.5	56.68	4	38.92	383	44.774	149	28.37	10	55.988	100	47.26	306	33.89	26	51.22	237
20.5	56.59	9	42.67	375	44.865	91	28.63	26	56.034	46	50.20	294	34.03	14	53.71	249
30.4	56.39	20	46.22	355	44.900	35	29.01	38	56.026	8	52.93	273	34.04	1	56.21	250
Feb. 9.4	56.09	30	49.49	327	44.880	20	29.48	47	55.966	60	55.38	245	33.92	12	58.64	243
19.4	55.70	39	52.39	290	44.808	72	30.00	52	55.858	108	57.50	212	33.69	23	60.87	223
Mar. 1.4	55.24	46	54.87	248	44.691	117	30.52	52	55.709	149	59.26	176	33.35	34	62.83	196
11.3	54.70	54	56.89	202	44.537	154	31.01	49	55.529	180	60.65	139	32.94	41	64.42	159
21.3	54.13	57	58.40	151	44.360	177	31.42	41	55.326	203	61.63	98	32.46	48	65.60	118
31.3	53.54	59	59.39	99	44.168	192	31.74	32	55.109	217	62.20	57	31.94	52	66.30	70
Apr. 10.3	52.94	60	59.83	44	43.974	194	31.94	20	54.892	217	62.36	16	31.41	53	66.52	22
20.2	52.34	60	59.74	9	43.788	186	32.02	8	54.682	210	62.11	25	30.90	51	66.24	28
30.2	51.77	57	59.12	62	43.622	166	31.99	3	54.487	195	61.47	64	30.42	48	65.49	75
May 10.2	51.26	51	58.00	112	43.482	140	31.84	15	54.317	170	60.46	101	30.00	42	64.29	120
20.1	50.78	48	56.40	160	43.375	107	31.58	26	54.174	143	59.12	134	29.65	35	62.70	159
30.1	50.38	40	54.36	204	43.307	68	31.24	34	54.067	107	57.45	167	29.39	26	60.78	192
June 9.1	50.04	34	51.93	243	43.278	29	30.84	40	53.997	70	55.51	194	29.23	16	58.57	221
19.1	49.80	24	49.19	274	43.290	12	30.39	45	53.965	32	53.34	217	29.15	8	56.15	242
29.0	49.64	16	46.20	299	43.343	53	29.90	49	53.973	8	51.02	232	29.18	3	53.59	256
July 9.0	49.58	6	43.06	314	43.434	91	29.38	52	54.021	48	48.59	243	29.31	13	50.95	264
19.0	49.61	3	39.83	323	43.564	130	28.84	54	54.107	86	46.14	245	29.54	23	48.29	266
29.0	49.74	13	36.63	320	43.728	164	28.28	56	54.230	123	43.73	241	29.85	31	45.68	261
Aug. 7.9	49.96	22	33.57	306	43.922	194	27.69	59	54.387	157	41.45	228	30.24	39	43.16	252
17.9	50.27	31	30.73	284	44.146	224	27.08	61	54.576	189	39.39	206	30.72	48	40.79	237
27.9	50.67	40	28.23	250	44.395	249	26.45	63	54.795	219	37.63	176	31.26	54	38.61	218
Sept. 6.8	51.14	47	26.16	207	44.665	270	25.77	68	55.041	246	36.22	141	31.86	60	36.65	196
16.8	51.66	52	24.59	157	44.955	290	25.05	72	55.309	268	35.25	97	32.51	65	34.97	168
26.8	52.24	58	23.62	97	45.263	308	24.31	74	55.597	288	34.76	49	33.21	70	33.58	139
Oct. 6.8	52.86	62	23.27	35	45.583	320	23.53	78	55.901	304	34.81	5	33.94	73	32.53	105
16.7	53.48	62	23.59	32	45.913	330	22.74	79	56.214	313	35.39	58	34.68	74	31.85	68
26.7	54.10	62	24.58	99	46.249	336	21.96	78	56.530	316	36.49	110	35.43	75	31.55	30
Nov. 5.7	54.70	60	26.20	162	46.585	336	21.21	75	56.843	313	38.10	161	36.17	74	31.65	10
15.7	55.26	56	28.43	223	46.915	330	20.54	67	57.145	302	40.17	207	36.89	72	32.16	51
25.6	55.75	49	31.18	275	47.231	316	19.95	59	57.429	284	42.63	246	37.56	67	33.08	92
Dec. 5.6	56.16	41	34.35	317	47.525	294	19.48	47	57.686	257	45.38	275	38.18	62	34.41	133
15.6	56.48	32	37.87	352	47.787	262	19.17	31	57.907	221	48.35	297	38.73	55	36.11	170
25.5	56.70	22	41.59	372	48.010	223	19.02	15	58.086	179	51.44	309	39.17	44	38.13	202
35.5	56.80	10	45.41	382	48.186	176	19.05	3	58.216	130	54.52	308	39.51	34	40.39	226
Mean Place	52.918		32.55		41.898		36.81		53.518		39.45		28.056		58.70	
Sec δ, Tan δ	2.648		−2.452		1.132		+0.531		1.145		−0.558		2.744		+2.556	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		−0.05		+0.07		+0.01		+0.05		−0.01		+0.13		+0.06	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.1		+0.9		−0.1		+0.9		−0.1		+0.9		−0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**β Canis Minoris.** Mag. 3.1				**ρ Geminorum.** Mag. 4.2				**σ Argus.** Mag. 3.3				**α² Geminorum.** (*Castor.*) Mag. 2.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	7 22		+ 8 26		7 23		+31 56		7 26		−43 8		7 29		+32 3	
	s		″		s		″		s		″		s		″	
Jan. 0.5	47.991		65.18		57.055		40.01		42.143		16.07		28.871		54.33	
		131		111		156		35		96		352		162		33
10.5	48.122		64.07		57.211		40.36		42.239		19.59		29.033		54.66	
		82		97		100		50		32		343		105		49
20.5	48.204		63.10		57.311		40.86		42.271	—	23.02		29.138		55.15	
		30		80		39		63		30		323		45		62
30.5	48.234	—	62.30		57.350	—	41.49		42.241		26.25		29.183	—	55.77	
		19		62		18		71		92		295		13		72
Feb. 9.4	48.215		61.68		57.332		42.20		42.149		29.20		29.170		56.49	
		66		47		72		73		146		260		68		74
19.4	48.149		61.21		57.260		42.93		42.003		31.80		29.102		57.23	
		105		31		120		69		192		220		115		73
Mar. 1.4	48.044		60.90		57.140		43.62		41.811		34.00		28.987		57.96	
		136		18		158		65		229		177		155		66
11.3	47.908		60.72		56.982		44.27		41.582		35.77		28.832		58.62	
		160		7		183		53		257		131		182		56
21.3	47.748		60.65	—	56.799		44.80		41.325		37.08		28.650		59.18	
		171		4		199		40		272		83		198		43
31.3	45.577		60.69		56.600		45.20		41.053		37.91		28.452		59.61	
		173		12		202		24		276		35 —		205		27
Apr. 10.3	47.404		60.81		56.398		45.44		40.777		38.26		28.247		59.88	
		165		21		194		8		270		13		193		11
20.2	47.239		61.02		56.204		45.52	—	40.507		38.13		28.054		59.99	—
		149		28		175		7		253		61		178		5
30.2	47.090		61.30		56.029		45.45		40.254		37.52		27.876		59.94	
		125		34		148		25		231		105		152		22
May 10.2	46.965		61.64		55.881		45.20		40.023		36.47		27.724		59.72	
		98		41		114		36		197		147		118		36
20.2	46.867		62.05		55.767		44.84		39.826		35.00		27.606		59.36	
		63		47		75		49		160		185		81		47
30.1	46.804		62.52		55.692		44.35		39.666		33.15		27.525		58.89	
		28		53		34		58		119		220		40		58
June 9.1	46.776	—	63.05		55.658	—	43.77		39.547		30.95		27.485	—	58.31	
		7		56		8		66		75		248		1		67
19.1	46.783		63.61		55.666		43.11		39.472		28.47		27.486		57.64	
		43		61		51		72		28		269		45		73
29.0	46.826		64.22		55.717		42.39		39.444	—	25.78		27.531		56.91	
		78		61		91		75		19		283		85		78
July 9.0	46.904		64.83		55.808		41.64.		39.463		22.95		27.616		56.13	
		111		60		131		77		65		288		124		80
19.0	47.015		65.43		55.939		40.87		39.528		20.07		27.740		55.33	
		141		56		167		80		111		286		161		83
29.0	47.156		65.99		56.106		40.07		39.639		17.21		27.901		54.50	
		170		49		200		81		155		273		192		86
Aug. 7.9	47.326		66.48		56.306		39.26		39.794		14.48		28.093		53.64	
		194		38		228		82		197		251		223		86
17.9	47.520		66.86		56.534		38.44		39.991		11.97		28.316		52.78	
		219		24		256		83		235		219		251		88
27.9	47.739		67.10		56.790		37.61		40.226		9.78		28.567		51.90	
		238		7 —		279		84		271		180		275		89
Sept. 6.9	47.977		67.17		57.069		36.77		40.497		7.98		28.842		51.01	
		258		13		301		84		301		132		297		91
16.8	48.235		67.04		57.370		35.93		40.798		6.66		29.139		50.10	
		272		33		317		85		326		79		314		90
26.8	48.507		66.71		57.687		35.08		41.124		5.87		29.453		49.20	
		285		55		332		83		346		20		330		89
Oct. 6.8	48.792		66.16		58.019		34.25		41.470		5.67	—	29.783		48.31	
		295		78		343		81		357		42		342		88
16.7	49.087		65.38		58.362		33.44		41.827		6.09		30.125		47.43	
		301		96		350		77		362		102		349		81
26.7	49.388		64.42		58.712		32.67		42.189		7.11		30.474		46.62	
		300		115		350		67		357		161		350		73
Nov. 5.7	49.688		63.27		59.062		32.00		42.546		8.72		30.824		45.89	
		296		127		344		59		342		216		346		64
15.7	49.984		62.00		59.406		31.41		42.888		10.88		31.170		45.25	
		283		136		330		45		318		263		333		50
25.6	50.267		60.64		59.736		30.96		43.206		13.51		31.503		44.75	
		262		140		306		28		285		301		310		34
Dec. 5.6	50.529		59.24		60.042		30.68		43.491		16.52		31.813		44.41	
		236		136		275		11 —		241		329		280		14 —
15.6	50.765		57.88		60.317		30.57		43.732		19.81		32.093		44.27	
		198		130		236		7		188		348		240		4
25.6	50.963		56.58		60.553		30.64		43.920		23.29		32.333		44.31	
		157		118		185		27		133		353		191		25
35.5	51.120		55.40		60.738		30.91		44.053		26.82		32.524		44.56	
Mean Place	45.560		72.68		54.241		48.96		39.604		12.52		26.068		63.66	
Sec δ, Tan δ	1.011		+0.149		1.178		+0.624		1.370		−0.937		1.180		+0.626	
$D_\psi\alpha$, $D_\omega\alpha$	+0.07		0.00		+0.08		+0.01		+0.05		−0.02		+0.08		+0.02	
$D_\psi\delta$, $D_\omega\delta$	−0.1		+0.9		−0.1		+0.9		−0.1		+0.9		−0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	25 Monocerotis. Mag. 5.2				α Canis Minoris. (*Procyon.*) Mag. 0.5				24 Lyncis. Mag. 5.0				κ Geminorum. Mag. 3.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	7 33		− 3 55		7 35		+ 5 25		7 36		+58 53		7 39		+24 35	
	s		″		s		″		s		″		s		″	
Jan. 0.5	17.360	132	51.54	188	6.094	135	52.71	136	13.869	237	54.01	184	36.245	163	26.24	16
10.5	17.492	82	53.42	173	6.229	87	51.35	119	14.106	146	55.85	201	36.408	110	26.08	0
20.5	17.574	33	55.15	153	6.316	36	50.16	102	14.252	54	57.86	209	36.518	55	26.08	16
30.5	17.607	— 17	56.68	134	6.352	— 14	49.14	82	14.306	— 40	59.95	209	36.573	— 2	26.24	30
Feb. 9.4	17.590	62	58.02	109	6.338	60	48.32	63	14.266	126	62.04	198	36.571	53	26.54	38
19.4	17.528	102	59.11	87	6.278	101	47.69	47	14.140	204	64.02	179	36.518	98	26.92	43
Mar. 1.4	17.426	134	59.98	63	6.177	133	47.22	29	13.936	267	65.81	152	36.420	136	27.35	44
11.4	17.292	157	60.61	42	6.044	155	46.93	15	13.669	315	67.33	118	36.284	164	27.79	42
21.3	17.135	170	61.03	18	5.889	170	46.78	2	13.354	344	68.51	81	36.120	180	28.21	37
31.3	16.965	176	61.21	— 1	5.719	173	46.76	— 10	13.010	356	69.32	39	35.940	185	28.58	29
Apr. 10.3	16.789	167	61.20	22	5.546	165	46.86	21	12.654	348	69.71	— 1	35.755	180	28.87	19
20.2	16.622	154	60.98	40	5.381	152	47.07	31	12.306	327	69.70	43	35.575	165	29.06	11
30.2	16.468	133	60.58	58	5.229	129	47.38	39	11.979	288	69.27	83	35.410	143	29.17	1
May 10.2	16.335	106	60.00	76	5.100	103	47.77	48	11.691	239	68.44	118	35.267	113	29.18	— 7
20.2	16.229	75	59.24	90	4.997	70	48.25	56	11.452	180	67.26	148	35.154	79	29.11	14
30.1	16.154	44	58.34	104	4.927	36	48.81	62	11.272	117	65.78	176	35.075	44	28.97	22
June 9.1	16.110	8	57.30	115	4.891	2	49.43	68	11.155	48	64.02	196	35.031	4	28.75	27
19.1	16.102	— 27	56.15	122	4.889	— 33	50.11	72	11.107	— 19	62.06	212	35.027	— 34	28.48	31
29.1	16.129	60	54.93	126	4.922	68	50.83	72	11.126	89	59.94	221	35.061	71	28.17	35
July 9.0	16.189	91	53.67	127	4.990	100	51.55	70	11.215	154	57.73	227	35.132	107	27.82	39
19.0	16.280	124	52.40	122	5.090	130	52.25	66	11.369	217	55.46	227	35.239	140	27.43	44
29.0	16.404	152	51.18	111	5.220	159	52.91	58	11.586	275	53.19	222	35.379	172	26.99	48
Aug. 7.9	16.556	178	50.07	99	5.379	184	53.49	46	11.861	329	50.97	214	35.551	200	26.51	53
17.9	16.734	203	49.08	77	5.563	209	53.95	30	12.190	377	48.83	203	35.751	225	25.98	58
27.9	16.937	224	48.31	55	5.772	229	54.25	12	12.567	419	46.80	186	35.976	250	25.40	66
Sept. 6.9	17.161	245	47.76	25	6.001	248	54.37	— 10	12.986	458	44.94	168	36.226	270	24.74	76
16.8	17.406	263	47.51	— 4	6.249	266	54.27	35	13.444	490	43.26	146	36.496	290	23.98	81
26.8	17.669	276	47.55	39	6.515	280	53.92	59	13.934	515	41.80	121	36.786	306	23.17	87
Oct. 6.8	17.945	287	47.94	73	6.795	290	53.33	83	14.449	535	40.59	93	37.092	319	22.30	93
16.8	18.232	294	48.67	105	7.085	297	52.50	106	14.984	544	39.66	62	37.411	327	21.37	96
26.7	18.526	297	49.72	134	7.382	299	51.44	127	15.528	545	39.04	29	37.738	331	20.41	96
Nov. 5.7	18.823	292	51.06	160	7.681	294	50.17	142	16.073	534	38.75	— 6	38.069	329	19.45	93
15.7	19.115	280	52.66	179	7.975	283	48.75	154	16.607	513	38.81	42	38.398	318	18.52	86
25.6	19.395	260	54.45	193	8.258	264	47.21	159	17.120	475	39.23	79	38.716	298	17.66	75
Dec. 5.6	19.655	234	56.38	200	8.522	238	45.62	159	17.595	424	40.02	115	39.014	271	16.91	61
15.6	19.889	198	58.38	199	8.760	202	44.03	153	18.019	362	41.17	145	39.285	235	16.30	45
25.6	20.087	157	60.37	193	8.962	161	42.50	142	18.381	285	42.62	173	39.520	191	15.85	26
35.5	20.244		62.30		9.123		41.08		18.666		44.35		39.711		15.59	
Mean Place	15.027		44.77		3.760		60.15		9.762		65.06		33.628		35.71	
Sec δ, Tan δ	1.002		−0.069		1.004		+0.095		1.936		+1.657		1.100		+0.458	
Dψα, Dωα	+0.06		0.00		+0.06		0.00		+0.10		+0.04		+0.07		+0.01	
Dψδ, Dωδ	−0.2		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**β Geminorum.** (*Pollux.*) Mag. 1.2				**4 Puppis.** Mag. 5.1				**ξ Argus.** Mag. 3.5				**φ Geminorum.** Mag. 5.0			
	Right Ascension.		**Declination.**		**Right Ascension.**		**Declination.**		**Right Ascension.**		**Declination.**		**Right Ascension.**		**Declination.**	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	7 40		+28 13		7 42		−14 21		7 45		−24 39		7 48		+26 58	
	s		″		s		″		s		″		s		″	
Jan. 0.5	24.405	168	12.75	4	15.391	133	63.70	246	55.581	132	25.13	294	35.222	176	25.66	7
10.5	24.573	112	12.79	24	15.524	84	66.16	232	55.713	79	28.07	282	35.398	122	25.59	— 13
20.5	24.685	56	13.03	38	15.608	33	68.48	213	55.792	26	30.89	264	35.520	65	25.72	31
30.5	24.741	— 3	13.41	50	15.641	— 17	70.61	190	55.818	— 27	33.53	240	35.585	9	26.03	42
Feb. 9.4	24.738	55	13.91	57	15.624	64	72.51	163	55.791	75	35.93	210	35.594	— 45	26.45	52
19.4	24.683	102	14.48	60	15.560	105	74.14	135	55.716	118	38.03	178	35.549	93	26.97	57
Mar. 1.4	24.581	141	15.08	58	15.455	138	75.49	104	55.598	153	39.81	143	35.456	133	27.54	57
11.4	24.440	170	15.66	53	15.317	163	76.53	74	55.445	178	41.24	105	35.323	163	28.11	53
21.3	24.270	187	16.19	44	15.154	177	77.27	44	55.267	194	42.29	68	35.160	180	28.64	46
31.3	24.083	194	16.63	32	14.977	182	77.71	14	55.073	200	42.97	30	34.980	188	29.10	36
Apr. 10.3	23.889	188	16.95	19	14.795	178	77.85	— 16	54.873	197	43.27	— 6	34.792	185	29.46	24
20.2	23.701	172	17.14	6	14.617	165	77.69	43	54.676	185	43.21	42	34.607	170	29.70	13
30.2	23.529	150	17.20	— 6	14.452	147	77.26	70	54.491	166	42.79	78	34.437	150	29.83	0
May 10.2	23.379	120	17.14	19	14.305	120	76.56	95	54.325	141	42.01	110	34.287	121	29.83	10
20.2	23.259	84	16.95	28	14.185	92	75.61	118	54.184	111	40.91	139	34.166	88	29.73	22
30.1	23.175	48	16.67	38	14.093	59	74.43	138	54.073	78	39.52	167	34.078	52	29.51	31
June 9.1	23.127	7	16.29	45	14.034	25	73.05	154	53.995	44	37.85	188	34.026	13	29.20	38
19.1	23.120	— 32	15.84	51	14.009	— 9	71.51	167	53.951	7	35.97	206	34.013	— 25	28.82	44
29.1	23.152	71	15.33	56	14.018	43	69.84	175	53.944	— 29	33.91	217	34.038	64	28.38	49
July 9.0	23.223	107	14.77	61	14.061	77	68.09	177	53.973	65	31.74	221	34.102	98	27.89	56
19.0	23.330	142	14.16	65	14.138	110	66.32	173	54.038	98	29.53	219	34.200	134	27.33	60
29.0	23.472	175	13.51	70	14.248	139	64.59	162	54.136	133	27.34	209	34.334	166	26.73	65
Aug. 7.9	23.647	204	12.81	73	14.387	168	62.97	148	54.269	165	25.25	192	34.500	194	26.08	71
17.9	23.851	230	12.08	77	14.555	194	61.49	123	54.434	194	23.33	166	34.694	223	25.37	76
27.9	24.081	256	11.31	81	14.749	220	60.26	96	54.628	223	21.67	134	34.917	248	24.61	81
Sept. 6.9	24.337	277	10.50	87	14.969	241	59.30	61	54.851	248	20.33	96	35.165	269	23.80	88
16.8	24.614	297	9.63	90	15.210	261	58.69	22	55.099	269	19.37	50	35.434	290	22.92	93
26.8	24.911	313	8.73	94	15.471	277	58.47	— 19	55.368	287	18.87	2	35.724	308	21.99	98
Oct. 6.8	25.224	327	7.79	95	15.748	290	58.66	62	55.655	303	18.85	— 47	36.032	322	21.01	100
16.8	25.551	336	6.84	94	16.038	298	59.28	103	55.958	310	19.32	99	36.354	333	20.01	102
26.7	25.887	340	5.90	91	16.336	301	60.31	142	56.268	313	20.31	147	36.687	338	18.99	100
Nov. 5.7	26.227	336	4.99	84	16.637	297	61.73	179	56.581	307	21.78	189	37.025	336	17.99	93
15.7	26.563	326	4.15	72	16.934	285	63.52	208	56.888	295	23.67	228	37.361	328	17.06	84
25.6	26.889	308	3.43	60	17.219	265	65.60	230	57.183	274	25.95	259	37.689	310	16.22	71
Dec. 5.6	27.197	278	2.83	43	17.484	239	67.90	244	57.457	243	28.54	279	37.999	284	15.51	55
15.6	27.475	240	2.40	23	17.723	202	70.34	251	57.700	204	31.33	292	38.283	247	14.96	36
25.6	27.715	196	2.17	5	17.925	160	72.85	248	57.904	160	34.25	294	38.530	203	14.60	15
35.5	27.911		2.12		18.085		75.33		58.064		37.19		38.733		14.45	
Mean Place	21.720		22.53		13.090		57.88		53.258		20.43		32.587		35.82	
Sec δ, Tan δ	1.135		+0.537		1.032		−0.256		1.100		−0.459		1.122		+0.509	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		+0.02		+0.05		−0.01		+0.05		−0.01		+0.07		+0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.2		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**26 Lyncis.** Mag. 5.7				**Groombridge 1374.** Mag. 5.6				**χ Argus.** Mag. 3.6				**ω Cancri.** Mag. 5.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 7 48		° ′ +47 46		h m 7 50		° ′ +74 7		h m 7 54		° ′ −52 45		h m 7 56		° ′ +25 36	
	s		″		s		″		s		″		s		″	
Jan. 0.6	52.577	216	21.35	120	38.55	42	58.11	246	45.971	132	54.68	377	4.529	181	45.54	17
10.5	52.793	147	22.55	138	38.97	25	60.57	266	46.103	57	58.45	373	4.710	129	45.37	— 2
20.5	52.940	73	23.93	152	39.22	8	63.23	273	46.160	— 16	62.18	359	4.839	73	45.39	21
30.5	53.013	0	25.45	158	39.30	— 8	65.96	271	46.144	90	65.77	338	4.912	16	45.60	35
Feb. 9.4	53.013	69	27.03	156	39.22	24	68.67	256	46.054	155	69.15	306	4.928	— 37	45.95	46
19.4	52.944	132	28.59	148	38.98	40	71.23	232	45.899	214	72.21	269	4.891	85	46.41	52
Mar. 1.4	52.812	184	30.07	131	38.58	52	73.55	198	45.685	262	74.90	227	4.806	126	46.93	54
11.4	52.628	224	31.38	108	38.06	61	75.53	156	45.423	298	77.17	181	4.680	156	47.47	53
21.3	52.404	250	32.46	81	37.45	67	77.09	108	45.125	323	78.98	132	4.524	175	48.00	47
31.3	52.154	260	33.27	52	36.78	71	78.17	56	44.802	336	80.30	82	4.349	183	48.47	39
Apr. 10.3	51.894	257	33.79	19	36.07	71	78.73	3	44.466	335	81.12	32	4.166	182	48.86	29
20.3	51.637	242	33.98	— 13	35.36	69	78.76	— 50	44.131	326	81.44	— 21	3.984	169	49.15	17
30.2	51.395	215	33.85	44	34.67	62	78.26	99	43.805	304	81.23	70	3.815	150	49.32	7
May 10.2	51.180	177	33.41	74	34.05	55	77.27	145	43.501	277	80.53	119	3.665	123	49.39	— 4
20.2	51.003	135	32.67	99	33.50	44	75.82	186	43.224	239	79.34	162	3.542	92	49.35	14
30.1	50.868	87	31.68	122	33.06	34	73.96	221	42.985	197	77.72	204	3.450	55	49.21	23
June 9.1	50.781	36	30.46	141	32.72	22	71.75	250	42.788	149	75.68	237	3.395	19	48.98	30
19.1	50.745	— 15	29.05	155	32.50	9	69.25	271	42.639	98	73.31	267	3.376	— 18	48.68	37
29.1	50.760	67	27.50	167	32.41	— 5	66.54	285	42.541	43	70.64	286	3.394	55	48.31	45
July 9.0	50.827	117	25.83	173	32.46	17	63.69	293	42.498	— 10	67.78	300	3.449	90	47.86	49
19.0	50.944	163	24.10	177	32.63	29	60.76	295	42.508	67	64.78	303	3.539	125	47.37	54
29.0	51.107	207	22.33	177	32.92	41	57.81	289	42.575	123	61.75	297	3.664	155	46.83	60
Aug. 8.0	51.314	249	20.56	176	33.33	53	54.92	278	42.698	178	58.78	280	3.819	186	46.23	68
17.9	51.563	284	18.80	170	33.86	62	52.14	262	42.876	230	55.98	254	4.005	213	45.55	73
27.9	51.847	319	17.10	163	34.48	71	49.52	240	43.106	278	53.44	217	4.218	238	44.82	80
Sept. 6.9	52.166	349	15.47	154	35.19	79	47.12	214	43.384	323	51.27	172	4.456	262	44.02	88
16.8	52.515	375	13.93	143	35.98	85	44.98	183	43.707	361	49.55	119	4.718	282	43.14	95
26.8	52.890	399	12.50	127	36.83	93	43.15	148	44.068	392	48.36	61	5.000	301	42.19	101
Oct. 6.8	53.289	416	11.23	109	37.76	95	41.67	110	44.460	413	47.75	— 3	5.301	317	41.18	106
16.8	53.705	428	10.14	90	38.71	97	40.57	67	44.873	424	47.78	67	5.618	328	40.12	107
26.7	54.133	433	9.24	66	39.68	98	39.90	23	45.297	425	48.45	132	5.946	335	39.05	107
Nov. 5.7	54.566	430	8.58	40	40.66	96	39.67	— 24	45.722	412	49.77	192	6.281	336	37.98	103
15.7	54.996	417	8.18	11	41.62	90	39.91	70	46.134	387	51.69	246	6.617	327	36.95	94
25.7	55.413	392	8.07	— 20	42.52	85	40.61	117	46.521	351	54.15	293	6.944	311	36.01	82
Dec. 5.6	55.805	356	8.27	49	43.37	76	41.78	161	46.872	302	57.08	329	7.255	287	35.19	65
15.6	56.161	310	8.76	79	44.13	65	43.39	200	47.174	242	60.37	357	7.542	251	34.54	47
25.6	56.471	253	9.55	108	44.78	50	45.39	230	47.416	175	63.94	370	7.793	209	34.07	27
35.5	56.724		10.63		45.28		47.69		47.591		67.64		8.002		33.80	
Mean Place	49.294		33.06		31.767		70.85		43.195		53.15		1.942		56.00	
Sec δ, Tan δ	1.488		+1.102		3.658		+3.518		1.653		−1.316		1.109		+0.479	
$D_\psi\alpha$, $D_\omega\alpha$	+0.09		+0.03		+0.14		+0.11		+0.03		−0.04		+0.07		+0.02	
$D_\psi\delta$, $D_\omega\delta$	−0 2		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Geminorum. Mag. 5.0				27 Lyncis. Mag. 4.9				ρ Argus. Mag. 2.9				3 H. Ursæ Majoris. Mag. 5.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	7 58		+28 0		8 2		+51 44		8 4		−24 4		8 4		+68 42	
	s		″		s		″		s		″		s		″	
Jan. 0.6	35.445	186	69.84	3	25.878	248	16.34	134	7.942	151	16.22	293	51.45	37	37.09	216
10.5	35.631	134	69.81	— 18	26.126	173	17.68	157	8.093	99	19.15	285	51.82	24	39.25	238
20.5	35.765	76	69.99	34	26.299	94	19.25	172	8.192	45	22.00	268	52.06	13	41.63	252
30.5	35.841	19	70.33	49	26.393	15	20.97	180	8.237	— 6	24.68	244	52.19	— 1	44.15	255
Feb. 9.5	35.860	— 36	70.82	59	26.408	— 61	22.77	180	8.231	57	27.12	217	52.18	14	46.70	247
19.4	35.824	86	71.41	64	26.347	131	24.57	170	8.174	100	29.29	186	52.04	26	49.17	229
Mar. 1.4	35.738	127	72.05	65	26.216	189	26.27	153	8.074	137	31.15	151	51.78	34	51.46	201
11.4	35.611	158	72.70	61	26.027	234	27.80	129	7.937	166	32.66	116	51.44	43	53.47	165
21.3	35.453	178	73.31	53	25.793	267	29.09	101	7.771	184	33.82	80	51.01	48	55.12	122
31.3	35.275	187	73.84	43	25.526	283	30.10	67	7.587	193	34.62	43	50.53	52	56.34	75
Apr. 10.3	35.088	186	74.27	30	25.243	283	30.77	30	7.394	192	35.05	5	50.01	51	57.09	26
20.3	34.902	175	74.57	16	24.960	271	31.07	— 4	7.202	184	35.10	— 30	49.50	51	57.35	— 23
30.2	34.727	154	74.73	4	24.689	244	31.03	40	7.018	167	34.80	64	48.99	47	57.12	71
May 10.2	34.573	127	74.77	— 9	24.445	209	30.63	74	6.851	147	34.16	96	48.52	41	56.41	117
20.2	34.446	96	74.68	23	24.236	166	29.89	105	6.704	118	33.20	127	48.11	35	55.24	157
30.2	34.350	60	74.45	32	24.070	116	28.84	130	6.586	90	31.93	155	47.76	26	53.67	192
June 9.1	34.290	22	74.13	41	23.954	63	27.54	153	6.496	56	30.38	176	47.50	16	51.75	223
19.1	34.268	— 15	73.72	50	23.891	9	26.01	172	6.440	21	28.62	194	47.34	8	49.52	245
29.1	34.283	53	73.22	57	23.882	— 46	24.29	185	6.419	— 12	26.68	208	47.26	— 1	47.07	263
July 9.0	34.336	89	72.65	63	23.928	99	22.44	196	6.431	47	24.60	214	47.27	11	44.44	274
19.0	34.425	124	72.02	70	24.027	152	20.48	201	6.478	82	22.46	212	47.38	21	41.70	279
29.0	34.549	156	71.32	75	24.179	199	18.47	204	6.560	115	20.34	206	47.59	29	38.91	278
Aug. 8.0	34.705	186	70.57	81	24.378	244	16.43	202	6.675	147	18.28	190	47.88	37	36.13	272
17.9	34.891	215	69.76	86	24.622	287	14.41	198	6.822	178	16.38	166	48.25	44	33.41	259
27.9	35.106	240	68.90	93	24.909	325	12.43	190	7.000	207	14.72	137	48.69	52	30.82	244
Sept. 6.9	35.346	266	67.97	98	25.234	361	10.53	180	7.207	234	13.35	99	49.21	58	28.38	221
16.8	35.612	287	66.99	105	25.595	392	8.73	165	7.441	260	12.36	57	49.79	63	26.17	197
26.8	35.899	307	65.94	107	25.987	419	7.08	148	7.701	280	11.79	10	50.42	68	24.20	165
Oct. 6.8	36.206	322	64.87	110	26.406	442	5.60	128	7.981	298	11.69	— 39	51.10	72	22.55	132
16.8	36.528	335	63.77	109	26.848	458	4.32	104	8.279	310	12.08	90	51.82	74	21.23	96
26.7	36.863	342	62.68	107	27.306	466	3.28	76	8.589	316	12.98	137	52.56	76	20.27	53
Nov. 5.7	37.205	342	61.61	99	27.772	465	2.52	47	8.905	314	14.35	182	53.32	75	19.74	10
15.7	37.547	335	60.62	88	28.237	453	2.05	14	9.219	303	16.17	220	54.07	72	19.64	— 35
25.7	37.882	319	59.74	73	28.690	432	1.91	— 21	9.522	286	18.37	251	54.79	68	19.99	80
Dec. 5.6	38.201	293	59.01	56	29.122	395	2.12	56	9.808	258	20.88	274	55.47	61	20.79	124
15.6	38.494	258	58.45	36	29.517	346	2.68	87	10.066	221	23.62	289	56.08	53	22.03	164
25.6	38.752	215	58.09	14	29.863	285	3.55	120	10.287	179	26.51	292	56.61	44	23.67	200
35.5	38.967		57.95		30.148		4.75		10.466		29.43		57.05		25.67	
Mean Place	32.819		80.69		22.454		29.40		5.646		11.74		46.259		51.13	
Sec δ, Tan δ	1.133		+0.532		1.615		+1.268		1.095		−0.447		2.754		+2.566	
$D_\psi\alpha$, $D_\omega\alpha$	+0.07		+0.02		+0.09		+0.04		+0.05		−0.02		+0.12		+0.09	
$D_\psi\delta$, $D_\omega\delta$	−0.2		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Argus. Mag. 2.2				ζ Cancri (*mean*). Mag. 4.7				Bradley 1147. Mag. 5.7				20 Puppis. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 8 7		° ′ −47 5		h m 8 7		° ′ +17 53		h m 8 9		° ′ +75 59		h m 8 9		° ′ −15 32	
	s		″		s		″		s		″		s		″	
Jan. 0.6	4.840	152	52.44	367	36.565	184	25.16	69	31.55	52	67.10	242	38.846	161	41.66	255
10.5	4.992	85	56.11	364	36.749	133	24.47	50	32.07	35	69.52	267	39.007	111	44.21	246
20.5	5.077	17	59.75	351	36.882	80	23.97	30	32.42	15	72.19	278	39.118	60	46.67	228
30.5	5.094	49	63.26	331	36.962	27	23.67	13	32.57	3	74.97	281	39.178	8	48.95	205
Feb. 9.5	5.045	110	66.57	302	36.989	25	23.54	3	32.54	22	77.78	271	39.186	40	51.00	180
19.4	4.935	165	69.59	266	36.964	71	23.57	15	32.32	39	80.49	250	39.146	83	52.80	151
Mar. 1.4	4.770	211	72.25	227	36.893	110	23.72	26	31.93	54	82.99	219	39.063	120	54.31	121
11.4	4.559	247	74.52	183	36.783	140	23.98	30	31.39	65	85.18	178	38.943	147	55.52	91
21.3	4.312	270	76.35	136	36.643	161	24.28	33	30.74	74	86.96	131	38.796	167	56.43	59
31.3	4.042	283	77.71	88	36.482	170	24.61	33	30.00	80	88.27	82	38.629	175	57.02	29
Apr. 10.3	3.759	286	78.59	38	36.312	169	24.94	31	29.20	81	89.09	27	38.454	176	57.31	0
20.3	3.473	279	78.97	10	36.143	160	25.25	28	28.39	79	89.36	27	38.278	167	57.31	30
30.2	3.194	261	78.87	59	35.983	144	25.53	22	27.60	74	89.09	80	38.111	153	57.01	57
May 10.2	2.933	238	78.28	105	35.839	119	25.75	20	26.86	67	88.29	129	37.958	132	56.44	84
20.2	2.695	206	77.23	148	35.720	92	25.95	16	26.19	57	87.00	173	37.826	106	55.60	108
30.2	2.489	170	75.75	186	35.628	60	26.11	13	25.62	45	85.27	213	37.720	77	54.52	128
June 9.1	2.319	129	73.89	222	35.568	26	26.24	7	25.17	32	83.14	245	37.643	47	53.24	146
19.1	2.190	85	71.67	250	35.542	8	26.31	4	24.85	18	80.69	270	37.596	14	51.78	162
29.1	2.105	37	69.17	271	35.550	41	26.35	1	24.67	4	77.99	288	37.582	18	50.16	170
July 9.0	2.068	9	66.46	284	35.591	75	26.34	6	24.63	11	75.11	303	37.600	50	48.46	175
19.0	2.077	58	63.62	290	35.666	107	26.28	12	24.74	24	72.08	306	37.650	83	46.71	173
29.0	2.135	106	60.72	284	35.773	136	26.16	20	24.98	37	69.02	305	37.733	113	44.98	164
Aug. 8.0	2.241	153	57.88	270	35.909	165	25.96	28	25.35	51	65.97	298	37.846	142	43.34	151
17.9	2.394	200	55.18	245	36.074	191	25.68	40	25.86	63	62.99	283	37.988	172	41.83	129
27.9	2.594	244	52.73	212	36.265	217	25.28	51	26.49	74	60.16	264	38.160	199	40.54	108
Sept. 6.9	2.838	282	50.61	170	36.482	239	24.77	65	27.23	83	57.52	241	38.359	224	39.51	70
16.9	3.120	320	48.91	117	36.721	262	24.12	79	28.06	92	55.11	210	38.583	249	38.81	32
26.8	3.440	350	47.74	62	36.983	281	23.33	92	28.98	100	53.01	176	38.832	268	38.49	9
Oct. 6.8	3.790	371	47.12	1	37.264	299	22.41	105	29.98	104	51.25	138	39.100	286	38.58	53
16.8	4.161	386	47.11	61	37.563	311	21.36	117	31.02	108	49.87	95	39.386	298	39.11	94
26.7	4.547	391	47.72	123	37.874	319	20.19	123	32.10	109	48.92	49	39.684	307	40.05	136
Nov. 5.7	4.938	385	48.95	182	38.193	322	18.96	127	33.19	108	48.43	1	39.991	307	41.41	174
15.7	5.323	367	50.77	237	38.515	316	17.69	127	34.27	105	48.42	49	40.298	299	43.15	206
25.7	5.690	338	53.14	280	38.831	302	16.42	120	35.32	98	48.91	98	40.597	284	45.21	230
Dec. 5.6	6.028	298	55.94	319	39.133	281	15.22	111	36.30	89	49.89	145	40.881	259	47.51	248
15.6	6.326	247	59.13	345	39.414	248	14.11	96	37.19	77	51.34	187	41.140	226	49.99	258
25.6	6.573	189	62.58	361	39.662	209	13.15	80	37.96	62	53.21	224	41.366	187	52.57	256
35.6	6.762		66.19		39.871		12.35		38.58		55.45		41.553		55.13	
Mean Place	2.246		50.89		34.130		35.32		24.306		81.71		36.588		36.06	
Sec δ, Tan δ	1.469		−1.076		1.051		+0.323		4.135		+4.012		1.038		−0.278	
Dψα, Dωα	+0.04		−0.04		+0.07		+0.01		+0.15		+0.14		+0.05		−0.01	
Dψδ, Dωδ	−0.2		+0.9		−0.2		+0.8		−0.2		+0.8		−0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Cancri. Mag. 3.8				31 Lyncis. Mag. 4.4				d^1 Cancri. Mag. 5.9				ε Argus. Mag. 1.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 8 12		° ′ + 9 25		h m 8 17		° ′ +43 26		h m 8 18		° ′ +18 35		h m 8 20		° ′ −59 14	
	s		″		s		″		s		″		s		″	
Jan. 0.6	9.763	179	60.77	121	20.856	238	43.32	80	46.103	194	24.72	69	54.204	185	54.24	382
10.5	9.942	130	59.56	104	21.094	177	44.12	104	46.297	145	24.03	49	54.389	98	58.06	386
20.5	10.072	80	58.52	85	21.271	109	45.16	125	46.442	91	23.54	28	54.487	11	61.92	380
30.5	10.152	27	57.67	63	21.380	38	46.41	137	46.533	38	23.26	9	54.498	72	65.72	363
Feb. 9.5	10.179	22	57.04	46	21.418	27	47.78	144	46.571	15	23.17	7	54.426	153	69.35	338
19.4	10.157	67	56.58	26	21.391	88	49.22	142	46.556	62	23.24	22	54.273	222	72.73	306
Mar. 1.4	10.090	104	56.32	13	21.303	141	50.64	135	46.494	102	23.46	30	54.051	284	75.79	266
11.4	9.986	134	56.19	0	21.162	184	51.99	119	46.392	133	23.76	36	53.767	331	78.45	224
21.4	9.852	152	56.19	11	20.978	213	53.18	99	46.259	155	24.12	38	53.436	368	80.69	175
31.3	9.700	163	56.30	19	20.765	229	54.17	73	46.104	169	24.50	39	53.068	388	82.44	126
Apr. 10.3	9.537	163	56.49	27	20.536	233	54.90	47	45.935	169	24.89	36	52.680	398	83.70	74
20.3	9.374	155	56.76	32	20.303	224	55.37	18	45.766	161	25.25	32	52.282	395	84.44	21
30.2	9.219	139	57.08	36	20.079	205	55.55	12	45.605	147	25.57	27	51.887	381	84.65	31
May 10.2	9.080	117	57.44	40	19.874	177	55.43	38	45.458	124	25.84	20	51.506	354	84.34	82
20.2	8.963	92	57.84	42	19.697	143	55.05	66	45.334	98	26.04	16	51.152	321	83.52	130
30.2	8.871	61	58.26	45	19.554	102	54.39	90	45.236	67	26.20	11	50.831	279	82.22	176
June 9.1	8.810	30	58.71	47	19.452	60	53.49	109	45.169	35	26.31	5	50.552	230	80.46	216
19.1	8.780	1	59.18	47	19.392	15	52.40	127	45.134	3	26.36	0	50.322	175	78.30	251
29.1	8.781	35	59.65	46	19.377	31	51.13	142	45.131	32	26.36	5	50.147	115	75.79	276
July 9.1	8.816	66	60.11	43	19.408	74	49.71	153	45.163	64	26.31	11	50.032	50	73.03	296
19.0	8.882	95	60.54	37	19.482	116	48.18	162	45.227	95	26.20	19	49.982	14	70.07	308
29.0	8.977	125	60.91	29	19.598	158	46.56	168	45.322	126	26.01	27	49.996	81	66.99	306
Aug. 8.0	9.102	152	61.20	17	19.756	196	44.88	171	45.448	155	25.74	36	50.077	150	63.93	296
17.9	9.254	179	61.37	4	19.952	232	43.17	172	45.603	181	25.38	47	50.227	215	60.97	277
27.9	9.433	204	61.41	13	20.184	268	41.45	172	45.784	208	24.91	59	50.442	279	58.20	246
Sept. 6.9	9.637	226	61.28	33	20.452	298	39.73	168	45.992	232	24.32	74	50.721	337	55.74	205
16.9	9.863	250	60.95	52	20.750	327	38.05	160	46.224	256	23.58	86	51.058	390	53.69	155
26.8	10.113	269	60.43	75	21.077	354	36.45	154	46.480	276	22.72	99	51.448	433	52.14	98
Oct. 6.8	10.382	286	59.68	94	21.431	376	34.91	141	46.756	295	21.73	113	51.881	467	51.16	37
16.8	10.668	299	58.74	115	21.807	394	33.50	125	47.051	311	20.60	122	52.348	489	50.79	29
26.8	10.967	309	57.59	131	22.201	405	32.25	107	47.362	320	19.38	129	52.837	496	51.08	96
Nov. 5.7	11.276	311	56.28	143	22.606	409	31.18	84	47.682	324	18.09	132	53.333	488	52.04	158
15.7	11.587	306	54.85	152	23.015	402	30.34	57	48.006	321	16.77	131	53.821	466	53.62	217
25.7	11.893	294	53.33	154	23.417	387	29.77	28	48.327	310	15.46	124	54.287	427	55.79	273
Dec. 5.6	12.187	272	51.79	151	23.804	359	29.49	2	48.637	288	14.22	113	54.714	374	58.52	315
15.6	12.459	241	50.28	142	24.163	321	29.51	34	48.925	258	13.09	98	55.088	310	61.67	349
25.6	12.700	202	48.86	130	24.484	271	29.85	65	49.183	219	12.11	80	55.398	233	65.16	371
35.6	12.902		47.56		24.755		30.50		49.402		11.31		55.631		68.87	
Mean Place	7.426		69.98		17.895		56.90		43.693		35.44		51.181		54.66	
Sec δ, Tan δ	1.014		+0.166		1.377		+0.947		1.055		+0.336		1.956		−1.681	
$D_\psi a$, $D_\omega a$	+0.06		+0.01		+0.08		+0.04		+0.07		+0.01		+0.02		−0.06	
$D_\psi \delta$, $D_\omega \delta$	−0.2		+0.8		−0.2		+0.8		−0.2		+0.8		−0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**30 Monocerotis.** Mag. 4.0				**θ Chamæleontis.** Mag. 4.3				**ο Ursæ Majoris.** Mag. 3.5				**Groombridge 1450.** Mag. 6.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 8 21		° ′ − 3 38		h m 8 22		° ′ −77 13		h m 8 23		° ′ +60 58		h m 8 27		° ′ +38 17	
	s		″		s		″		s		″		s		″	
Jan. 0.6	39.108	177	36.12	198	71.12	27	23.62	377	36.91	33	69.66	168	42.096	236	29.04	42
10.5	39.285	131	38.10	184	71.39	9	27.39	387	37.24	23	71.34	195	42.332	179	29.46	71
20.5	39.416	81	39.94	165	71.48	10	31.26	386	37.47	15	73.29	216	42.511	117	30.17	91
30.5	39.497	29	41.59	144	71.38	29	35.12	375	37.62	4	75.45	226	42.628	51	31.08	108
Feb. 9.5	39.526	19	43.03	120	71.09	44	38.87	354	37.66	5	77.71	225	42.679	10	32.16	120
19.4	39.507	63	44.23	97	70.65	62	42.41	325	37.61	15	79.96	215	42.669	69	33.36	122
Mar. 1.4	39.444	99	45.20	73	70.03	73	45.66	290	37.46	22	82.11	197	42.600	119	34.58	118
11.4	39.345	130	45.93	50	69.30	84	48.56	248	37.24	29	84.08	169	42.481	159	35.76	110
21.4	39.215	149	46.43	28	68.46	92	51.04	203	36.95	33	85.77	134	42.322	188	36.86	96
31.3	39.066	160	46.71	8	67.54	98	53.07	155	36.62	37	87.11	96	42.134	205	37.82	75
Apr. 10.3	38.906	162	46.79	11	66.56	100	54.62	102	36.25	37	88.07	52	41.929	210	38.57	54
20.3	38.744	156	46.68	31	65.56	101	55.64	49	35.88	36	88.59	8	41.719	205	39.11	30
30.2	38.588	143	46.37	46	64.55	100	56.13	5	35.52	35	88.67	35	41.514	188	39.41	5
May 10.2	38.445	122	45.91	62	63.55	95	56.08	57	35.17	31	88.32	78	41.326	164	39.46	19
20.2	38.323	99	45.29	78	62.60	88	55.51	109	34.86	26	87.54	117	41.162	133	39.27	42
30.2	38.224	71	44.51	89	61.72	80	54.42	156	34.60	20	86.37	151	41.029	99	38.85	64
June 9.1	38.153	44	43.62	99	60.92	68	52.86	201	34.40	12	84.86	181	40.930	60	38.21	82
19.1	38.109	12	42.63	107	60.24	57	50.85	238	34.28	7	83.05	207	40.870	21	37.39	98
29.1	38.097	19	41.56	112	59.67	43	48.47	271	34.21	1	80.98	226	40.849	20	36.41	114
July 9.1	38.116	49	40.44	112	59.24	26	45.76	294	34.20	6	78.72	241	40.869	60	35.27	126
19.0	38.165	79	39.32	109	58.98	12	42.82	310	34.26	13	76.31	251	40.929	98	34.01	135
29.0	38.244	108	38.23	101	58.86	5	39.72	314	34.39	19	73.80	255	41.027	136	32.66	143
Aug. 8.0	38.352	135	37.22	88	58.91	23	36.58	308	34.58	26	71.25	254	41.163	172	31.23	150
17.9	38.487	163	36.34	70	59.14	39	33.50	293	34.84	31	68.71	250	41.335	206	29.73	154
27.9	38.650	189	35.64	49	59.53	54	30.57	265	35.15	37	66.21	241	41.541	237	28.19	157
Sept. 6.9	38.839	215	35.15	21	60.07	70	27.92	227	35.52	42	63.80	226	41.778	268	26.62	158
16.9	39.054	237	34.94	8	60.77	81	25.65	181	35.94	46	61.54	208	42.046	297	25.04	157
26.8	39.291	259	35.02	40	61.58	92	23.84	127	36.40	50	59.46	186	42.343	322	23.47	154
Oct. 6.8	39.550	277	35.42	73	62.50	99	22.57	65	36.90	53	57.60	159	42.665	346	21.93	147
16.8	39.827	292	36.15	106	63.49	104	21.92	1	37.43	56	56.01	127	43.011	364	20.46	137
26.8	40.119	303	37.21	135	64.53	104	21.93	66	37.99	57	54.74	94	43.375	377	19.09	123
Nov. 5.7	40.422	306	38.56	162	65.57	102	22.59	133	38.56	58	53.80	54	43.752	384	17.86	105
15.7	40.728	301	40.18	183	66.59	95	23.92	195	39.14	57	53.26	13	44.136	380	16.81	84
25.7	41.029	290	42.01	198	67.54	85	25.87	250	39.71	55	53.13	29	44.516	369	15.97	58
Dec. 5.6	41.319	268	43.99	207	68.39	71	28.37	298	40.26	50	53.42	72	44.885	344	15.39	30
15.6	41.587	240	46.06	208	69.10	57	31.35	336	40.76	45	54.14	113	45.229	310	15.09	2
25.6	41.827	201	48.14	202	69.67	39	34.71	364	41.21	38	55.27	150	45.539	265	15.07	29
35.6	42.028		50.16		70.06		38.35		41.59		56.77		45.804		15.36	
Mean Place	36.867		28.68		65.617		25.62		32.950		85.06		39.352		42.76	
Sec δ, Tan δ	1.002		−0.064		4.523		−4.411		2.062		+1.803		1.274		+0.790	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		0.00		−0.03		−0.17		+0.10		+0.07		+0.08		+0.03	
$D_\psi\delta$, $D_\omega\delta$	−0.2		+0.8		−0.2		+0.8		−0.2		+0.8		−0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Cancri. Mag. 5.5				Groombridge 1446. Mag. 6.3				δ Hydræ. Mag. 4.2				σ Hydræ. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	8 28		+20 42		8 30		+73 54		8 33		+ 5 58		8 34		+ 3 37	
	s		″		s		″		s		″		s		″	
Jan. 0.6	4.061	206	50.47	60	50.26	54	35.23	217	24.426	195	64.20	149	33.752	195	27.30	161
10.6	4.267	156	49.87	39	50.80	38	37.40	249	24.621	148	62.71	131	33.947	148	25.69	145
20.5	4.423	103	49.48	16	51.18	21	39.89	267	24.769	99	61.40	109	34.095	98	24.24	125
30.5	4.526	46	49.32	3	51.39	5	42.56	275	24.868	47	60.31	89	34.193	47	22.99	103
Feb. 9.5	4.572	5	49.35	19	51.44	11	45.31	273	24.915	4	59.42	67	34.240	3	21.96	82
19.4	4.567	54	49.54	34	51.33	27	48.04	258	24.911	48	58.75	48	34.237	47	21.14	59
Mar. 1.4	4.513	95	49.88	41	51.06	41	50.62	233	24.863	88	58.27	27	34.190	87	20.55	41
11.4	4.418	130	50.29	47	50.65	52	52.95	198	24.775	119	58.00	12	34.103	119	20.14	21
21.4	4.288	152	50.76	48	50.13	61	54.93	155	24.656	141	57.88	2	33.984	140	19.93	6
31.3	4.136	168	51.24	46	49.52	67	56.48	108	24.515	154	57.90	14	33.844	154	19.87	9
Apr. 10.3	3.968	170	51.70	41	48.85	69	57.56	57	24.361	158	58.04	26	33.690	157	19.96	22
20.3	3.798	163	52.11	35	48.16	68	58.13	4	24.203	154	58.30	33	33.533	153	20.18	32
30.3	3.635	150	52.46	28	47.48	66	58.17	50	24.049	142	58.63	40	33.380	142	20.50	42
May 10.2	3.485	130	52.74	19	46.82	60	57.67	99	23.907	122	59.03	47	33.238	123	20.92	50
20.2	3.355	103	52.93	12	46.22	53	56.68	147	23.785	101	59.50	53	33.115	101	21.42	57
30.2	3.252	74	53.05	5	45.69	44	55.21	187	23.684	74	60.03	56	33.014	74	21.99	64
June 9.1	3.178	44	53.10	3	45.25	33	53.34	224	23.610	46	60.59	59	32.940	48	22.63	70
19.1	3.134	10	53.07	10	44.92	22	51.10	254	23.564	15	61.18	61	32.892	17	23.33	72
29.1	3.124	23	52.97	17	44.70	9	48.56	276	23.549	14	61.79	61	32.875	13	24.05	72
July 9.1	3.147	56	52.80	26	44.61	3	45.80	293	23.563	44	62.40	58	32.888	42	24.77	69
19.0	3.203	87	52.54	33	44.64	14	42.87	305	23.607	74	62.98	52	32.930	72	25.46	66
29.0	3.290	118	52.21	41	44.78	27	39.82	307	23.681	102	63.50	44	33.002	99	26.12	57
Aug. 8.0	3.408	146	51.80	52	45.05	38	36.75	303	23.783	131	63.94	32	33.101	128	26.69	45
18.0	3.554	176	51.28	62	45.43	48	33.72	296	23.914	158	64.26	16	33.229	155	27.14	30
27.9	3.730	203	50.66	74	45.91	58	30.76	281	24.072	183	64.42	1	33.384	181	27.44	10
Sept. 6.9	3.933	227	49.92	86	46.49	67	27.95	261	24.255	210	64.41	22	33.565	207	27.54	12
16.9	4.160	254	49.06	99	47.16	77	25.34	237	24.465	232	64.19	45	33.772	231	27.42	35
26.8	4.414	275	48.07	110	47.93	82	22.97	205	24.697	256	63.74	71	34.003	255	27.07	64
Oct. 6.8	4.689	295	46.97	122	48.75	88	20.92	170	24.953	275	63.03	94	34.258	274	26.43	89
16.8	4.984	312	45.75	129	49.63	93	19.22	130	25.228	293	62.09	118	34.532	291	25.54	115
26.8	5.296	324	44.46	134	50.56	95	17.92	86	25.521	305	60.91	138	34.823	304	24.39	137
Nov. 5.7	5.620	330	43.12	135	51.51	96	17.06	38	25.826	311	59.53	154	35.127	310	23.02	158
15.7	5.950	328	41.77	131	52.47	94	16.68	11	26.137	310	57.99	167	35.437	308	21.44	172
25.7	6.278	318	40.46	121	53.41	90	16.79	61	26.447	300	56.32	173	35.745	298	19.72	179
Dec. 5.7	6.596	297	39.25	109	54.31	82	17.40	111	26.747	282	54.59	173	36.043	282	17.93	182
15.6	6.893	268	38.16	92	55.13	73	18.51	157	27.029	254	52.86	166	36.325	253	16.11	179
25.6	7.161	231	37.24	71	55.86	61	20.08	199	27.283	218	51.20	155	36.578	217	14.32	167
35.6	7.392		36.53		56.47		22.07		27.501		49.65		36.795		12.65	
Mean Place	1.657		61.89		44.168		51.78		22.176		73.42		31.520		36.15	
Sec δ, Tan δ	1.069		+0.378		3.608		+3.467		1.005		+0.105		1.002		+0.063	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.07		+0.02		+0.13		+0.14		+0.06		0.00		+0.06		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.2		+0.8		−0.2		+0.8		−0.2		+0.8		−0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cancri. Mag. 4.7				δ Cancri. Mag. 4.2				α Pyxidis. Mag. 3.7				ι Cancri. Mag. 4.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 8 38		° ′ +21 45		h m 8 40		° ′ +18 26		h m 8 40		° ′ −32 53		h m 8 41		° ′ +29 2	
	s		″		s		″		s		″		s		″	
Jan. 0.6	38.483	217	26.49	59	7.414	214	58.67	79	22.500	191	39.81	327	50.483	231	72.19	18
10.6	38.700	167	25.90	36	7.628	165	57.88	57	22.691	136	43.08	325	50.714	180	72.01	8
20.5	38.867	114	25.54	12	7.793	114	57.31	35	22.827	81	46.33	315	50.894	124	72.09	33
30.5	38.981	60	25.42	7	7.907	59	56.96	13	22.908	24	49.48	296	51.018	66	72.42	52
Feb. 9.5	39.041	6	25.49	27	7.966	7	56.83	5	22.932	30	52.44	273	51.084	8	72.94	70
19.4	39.047	45	25.76	40	7.973	42	56.88	22	22.902	80	55.17	241	51.092	45	73.64	79
Mar. 1.4	39.002	88	26.16	48	7.931	85	57.10	32	22.822	123	57.58	207	51.047	91	74.43	84
11.4	38.914	123	26.64	54	7.846	120	57.42	41	22.699	158	59.65	170	50.956	130	75.27	85
21.4	38.791	148	27.18	56	7.726	143	57.83	44	22.541	182	61.35	130	50.826	157	76.12	79
31.3	38.643	164	27.74	52	7.583	158	58.27	45	22.359	199	62.65	91	50.669	174	76.91	69
Apr. 10.3	38.479	169	28.26	48	7.425	164	58.72	43	22.160	205	63.56	49	50.495	181	77.60	57
20.3	38.310	164	28.74	40	7.261	161	59.15	39	21.955	203	64.05	7	50.314	178	78.17	43
30.3	38.146	154	29.14	31	7.100	149	59.54	34	21.752	194	64.12	33	50.136	164	78.60	26
May 10.2	37.992	134	29.45	22	6.951	131	59.88	28	21.558	178	63.79	73	49.972	147	78.86	10
20.2	37.858	109	29.67	12	6.820	107	60.16	20	21.380	155	63.06	109	49.825	120	78.96	6
30.2	37.749	82	29.79	3	6.713	79	60.36	15	21.225	128	61.97	143	49.705	92	78.90	23
June 9.1	37.667	52	29.82	6	6.634	51	60.51	8	21.097	101	60.54	174	49.613	59	78.67	36
19.1	37.615	19	29.76	14	6.583	20	60.59	1	20.996	68	58.80	199	49.554	26	78.31	49
29.1	37.596	14	29.62	24	6.563	12	60.60	5	20.928	34	56.81	219	49.528	9	77.82	62
July 9.1	37.610	45	29.38	32	6.575	43	60.55	14	20.894	0	54.62	232	49.537	43	77.20	75
19.0	37.655	77	29.06	41	6.618	74	60.41	23	20.894	37	52.30	238	49.580	77	76.45	84
29.0	37.732	108	28.65	51	6.692	104	60.18	32	20.931	74	49.92	237	49.657	110	75.61	94
Aug. 8.0	37.840	137	28.14	60	6.796	132	59.86	42	21.005	110	47.55	226	49.767	141	74.67	104
18.0	37.977	166	27.54	73	6.928	161	59.44	55	21.115	147	45.29	206	49.908	173	73.63	113
27.9	38.143	193	26.81	84	7.089	188	58.89	69	21.262	183	43.23	179	50.081	203	72.50	122
Sept. 6.9	38.336	221	25.97	95	7.277	216	58.20	82	21.445	218	41.44	145	50.284	230	71.28	130
16.9	38.557	247	25.02	107	7.493	241	57.38	96	21.663	250	39.99	102	50.514	258	69.98	136
26.8	38.804	270	23.95	120	7.734	265	56.42	111	21.913	279	38.97	53	50.772	284	68.62	142
Oct. 6.8	39.074	292	22.75	129	7.999	286	55.31	124	22.192	305	38.44	1	51.056	308	67.20	145
16.8	39.366	311	21.46	136	8.285	306	54.07	134	22.497	324	38.45	54	51.364	326	65.75	145
26.8	39.677	325	20.10	140	8.591	318	52.73	142	22.821	337	38.99	108	51.690	342	64.30	141
Nov. 5.7	40.002	332	18.70	140	8.909	327	51.31	145	23.158	342	40.07	162	52.032	352	62.89	133
15.7	40.334	332	17.30	136	9.236	327	49.86	144	23.500	337	41.69	209	52.384	350	61.56	119
25.7	40.666	325	15.94	125	9.563	318	48.42	138	23.837	323	43.78	250	52.734	344	60.37	104
Dec. 5.7	40.991	305	14.69	111	9.881	301	47.04	126	24.160	297	46.28	282	53.078	324	59.33	82
15.6	41.296	278	13.58	93	10.182	273	45.78	110	24.457	263	49.10	307	53.402	295	58.51	58
25.6	41.574	241	12.65	70	10.455	238	44.68	91	24.720	218	52.17	321	53.697	257	57.93	32
35.6	41.815		11.95		10.693		43.77		24.938		55.38		53.954		57.61	
Mean Place	36.107		38.51		5.083		70.21		20.206		37.47		48.010		85.49	
Sec δ, Tan δ	1.077		+0.399		1.054		+0.334		1.191		−0.647		1.144		+0.556	
$D_\psi a$, $D_\omega a$	+0.07		+0.02		+0.07		+0.01		+0.05		−0.03		+0.07		+0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.3		+0.8		−0.3		+0.8		−0.3		+0.8		−0.3		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Argus. Mag. 2.0				ε Hydræ. Mag. 3.5				σ^2 Cancri (*mean*). Mag. 5.5				ζ Hydræ. Mag. 3.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	8 42		−54 24		8 42		+ 6 42		8 49		+30 52		8 51		+ 6 14	
	s		″		s		″		s		″		s		″	
Jan. 0.6	30.559	216	39.81	373	31.523	204	51.21	148	20.893	244	59.52	12	9.043	211	66.95	152
10.6	30.775	140	43.54	380	31.727	157	49.73	129	21.137	188	59.40	— 17	9.254	165	65.43	134
20.5	30.915	64	47.34	378	31.884	108	48.44	107	21.325	134	59.57	41	9.419	116	64.09	112
30.5	30.979	— 14	51.12	364	31.992	56	47.37	86	21.459	76	59.98	63	9.535	64	62.97	90
Feb. 9.5	30.965	86	54.76	342	32.048	6	46.51	64	21.535	17	60.61	79	9.599	14	62.07	68
19.5	30.879	151	58.18	313	32.054	— 40	45.87	45	21.552	— 38	61.40	91	9.613	— 32	61.39	47
Mar. 1.4	30.728	208	61.31	278	32.014	81	45.42	24	21.514	87	62.31	95	9.581	73	60.92	27
11.4	30.520	256	64.09	236	31.933	112	45.18	9	21.427	125	63.26	95	9.508	107	60.65	11
21.4	30.264	290	66.45	192	31.821	136	45.09	— 5	21.302	156	64.21	89	9.401	130	60.54	— 4
31.3	29.974	317	68.37	143	31.685	151	45.14	17	21.146	174	65.10	78	9.271	147	60.58	16
Apr. 10.3	29.657	327	69.80	94	31.534	156	45.31	27	20.972	182	65.88	64	9.124	153	60.74	27
20.3	29.330	330	70.74	42	31.378	153	45.58	34	20.790	182	66.52	48	8.971	151	61.01	35
30.3	29.000	321	71.16	— 8	31.225	142	45.92	41	20.608	170	67.00	29	8.820	142	61.36	42
May 10.2	28.679	302	71.08	59	31.083	125	46.33	46	20.438	152	67.29	11	8.678	127	61.78	47
20.2	28.377	278	70.49	107	30.958	104	46.79	51	20.286	129	67.40	— 7	8.551	106	62.25	52
30.2	28.099	245	69.42	152	30.854	79	47.30	53	20.157	98	67.33	26	8.445	82	62.77	55
June 9.2	27.854	206	67.90	192	30.775	50	47.83	56	20.059	67	67.07	41	8.363	57	63.32	57
19.1	27.648	161	65.98	229	30.725	23	48.39	56	19.992	33	66.66	57	8.306	28	63.89	58
29.1	27.487	112	63.69	258	30.702	— 6	48.95	56	19.959	— 1	66.09	71	8.278	1	64.47	57
July 9.1	27.375	60	61.11	279	30.708	37	49.51	52	19.960	36	65.38	84	8.277	— 29	65.04	54
19.0	27.315	6	58.32	293	30.745	66	50.03	46	19.996	70	64.54	95	8.306	57	65.58	47
29.0	27.309	— 52	55.39	297	30.811	94	50.49	38	20.066	103	63.59	107	8.363	85	66.05	39
Aug. 8.0	27.361	110	52.42	290	30.905	122	50.87	24	20.169	136	62.52	117	8.448	114	66.44	26
18.0	27.471	168	49.52	274	31.027	148	51.11	11	20.305	166	61.35	126	8.562	140	66.70	11
27.9	27.639	224	46.78	247	31.175	177	51.22	— 6	20.471	198	60.09	134	8.702	169	66.81	— 6
Sept. 6.9	27.863	279	44.31	210	31.352	202	51.16	29	20.669	227	58.75	141	8.871	194	66.75	28
16.9	28.142	329	42.21	164	31.554	227	50.87	50	20.896	257	57.34	148	9.065	222	66.47	50
26.9	28.471	372	40.57	111	31.781	252	50.37	75	21.153	283	55.86	153	9.287	246	65.97	76
Oct. 6.8	28.843	408	39.46	51	32.033	272	49.62	98	21.436	309	54.33	153	9.533	269	65.21	98
16.8	29.251	434	38.95	— 12	32.305	290	48.64	121	21.745	328	52.80	152	9.802	288	64.23	123
26.8	29.685	449	39.07	77	32.595	305	47.43	142	22.073	347	51.28	147	10.090	304	63.00	142
Nov. 5.7	30.134	451	39.84	141	32.900	312	46.01	155	22.420	355	49.81	137	10.394	313	61.58	160
15.7	30.585	438	41.25	200	33.212	313	44.46	169	22.775	358	48.44	122	10.707	314	59.98	170
25.7	31.023	411	43.25	255	33.525	303	42.77	173	23.133	351	47.22	103	11.021	307	58.28	177
Dec. 5.7	31.434	371	45.80	300	33.828	288	41.04	173	23.484	333	46.19	80	11.328	292	56.51	177
15.6	31.805	320	48.80	335	34.116	261	39.31	166	23.817	305	45.39	55	11.620	266	54.74	171
25.6	32.125	256	52.15	361	34.377	226	37.65	154	24.122	267	44.84	25	11.886	234	53.03	160
35.6	32.381		55.76		34.603		36.11		24.389		44.59		12.120		51.43	
Mean Place	27.805		40.77		29.300		60.76		18.425		73.47		6.851		76.60	
Sec δ, Tan δ	1.718		−1.398		1.007		+0.118		1.165		+0.598		1.006		+0.110	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.03		−0.06		+0.06		+0.01		+0.07		+0.03		+0.06		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		+0.8		−0.3		+0.8		−0.3		+0.7		−0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ι Ursæ Majoris. Mag. 3.1				α Cancri. Mag. 4.3				b^1 Carinæ. Mag. 5.1				κ Ursæ Majoris. Mag. 3.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 8 53		° ′ +48 21		h m 8 54		° ′ +12 9		h m 8 54		° ′ −58 54		h m 8 58		° ′ +47 28	
	s		″		s		″		s		″		s		″	
Jan. 0.6	43.120		21.58		5.781		68.39		62.356		57.25		9.068		23.28	
10.6	43.418	298	22.41	83	6.000	219	67.19	120	62.606	250	60.98	373	9.368	300	24.04	76
20.5	43.651	233	23.57	116	6.173	173	66.19	100	62.774	168	64.83	385	9.606	238	25.12	108
30.5	43.815	164	24.99	142	6.296	123	65.43	76	62.857	83	68.68	385	9.775	169	26.48	136
Feb. 9.5	43.903	88	26.61	162	6.367	71	64.88	55	62.856	1	72.46	378	9.870	95	28.06	158
19.5	43.919	16	28.35	174	6.386	19	64.55	33	62.774	82	76.03	357	9.893	23	29.77	171
Mar. 1.4	43.863	56	30.13	178	6.357	29	64.42	13	62.617	157	79.36	333	9.845	48	31.52	175
11.4	43.745	118	31.86	173	6.287	70	64.45	3	62.394	223	82.33	297	9.737	108	33.24	172
21.4	43.575	170	33.44	158	6.181	106	64.61	16	62.118	276	84.92	259	9.576	161	34.83	159
31.4	43.365	210	34.84	140	6.051	130	64.88	27	61.799	319	87.07	215	9.375	201	36.25	142
Apr. 10.3	43.129	236	35.97	113	5.904	147	65.22	34	61.449	350	88.74	167	9.148	227	37.41	116
20.3	42.878	251	36.79	82	5.750	154	65.59	37	61.081	368	89.92	118	8.905	243	38.29	88
30.3	42.627	251	37.29	50	5.597	153	65.99	40	60.707	374	90.58	66	8.661	244	38.83	54
May 10.2	42.387	240	37.44	15	5.452	145	66.41	42	60.336	371	90.72	14	8.427	234	39.04	21
20.2	42.169	218	37.25	19	5.323	129	66.82	41	59.982	354	90.35	37	8.213	214	38.91	13
30.2	41.979	190	36.73	52	5.215	108	67.22	40	59.650	332	89.46	89	8.026	187	38.45	46
June 9.2	41.826	153	35.89	84	5.130	85	67.60	38	59.353	297	88.10	136	7.874	152	37.68	77
19.1	41.713	113	34.76	113	5.073	57	67.94	34	59.094	259	86.31	179	7.761	113	36.62	106
29.1	41.644	69	33.39	137	5.044	29	68.26	32	58.883	211	84.13	218	7.691	70	35.32	130
July 9.1	41.620	24	31.79	160	5.042	2	68.53	27	58.723	160	81.60	253	7.664	27	33.79	153
19.1	41.642	22	30.01	178	5.071	29	68.72	19	58.621	102	78.84	276	7.681	17	32.06	173
29.0	41.709	67	28.09	192	5.129	58	68.85	13	58.582	39	75.90	294	7.743	62	30.19	187
Aug. 8.0	41.821	112	26.05	204	5.214	85	68.88	3	58.606	24	72.88	302	7.848	105	28.19	200
18.0	41.976	155	23.92	213	5.328	114	68.80	8	58.697	91	69.89	299	7.996	148	26.10	209
27.9	42.174	198	21.76	216	5.470	142	68.56	24	58.854	157	67.03	286	8.185	189	23.96	214
Sept. 6.9	42.411	237	19.58	218	5.641	171	68.17	39	59.079	225	64.40	263	8.415	230	21.79	217
16.9	42.689	278	17.43	215	5.837	196	67.60	57	59.368	289	62.11	229	8.684	269	19.64	215
26.9	43.003	314	15.34	209	6.061	224	66.82	78	59.715	347	60.26	185	8.990	306	17.54	210
Oct. 6.8	43.352	349	13.34	200	6.310	249	65.87	95	60.115	400	58.93	133	9.331	341	15.52	202
16.8	43.732	380	11.47	187	6.582	272	64.71	116	60.558	443	58.19	74	9.702	371	13.63	189
26.8	44.139	407	9.80	167	6.874	292	63.39	132	61.034	476	58.09	10	10.102	400	11.92	171
Nov. 5.8	44.566	427	8.34	146	7.183	309	61.92	147	61.530	496	58.63	54	10.522	420	10.41	151
15.7	45.005	439	7.17	117	7.501	318	60.35	157	62.031	501	59.84	121	10.955	433	9.17	124
25.7	45.447	442	6.32	85	7.822	321	58.73	162	62.519	488	61.67	183	11.392	437	8.24	93
Dec. 5.7	45.880	433	5.80	52	8.137	315	57.10	163	62.983	464	64.05	238	11.822	430	7.66	58
15.6	46.290	410	5.66	14	8.436	299	55.53	157	63.403	420	66.94	289	12.231	409	7.45	21
25.6	46.668	378	5.91	25	8.712	276	54.07	146	63.766	363	70.21	327	12.608	377	7.62	17
35.6	46.997	329	6.54	63	8.952	240	52.77	130	64.062	296	73.78	357	12.938	330	8.17	55
Mean Place	40.201		38.19		3.562		79.25		59.435		59.42		6.216		40.07	
Sec δ, Tan δ	1.505		+1.124		1.023		+0.216		1.937		−1.659		1.480		+1.090	
$D_\psi a$, $D_\omega a$	+0.08		+0.05		+0.07		+0.01		+0.03		−0.08		+0.08		+0.05	
$D_\psi \delta$, $D_\omega \delta$	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ^2 Ursæ Majoris. Mag. 4.9				κ Cancri. Mag. 5.1				λ Argus. Mag. 2.2				θ Hydræ. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 3		+67 27		9 3		+10 59		9 5		−43 6		9 10		+ 2 38	
	s		″		s		″		s		″		s		″	
Jan. 0.6	21.52		33.66		23.903		30.84		3.343		18.52		11.214		75.16	
10.6	22.00	48	35.32	166	24.128	225	29.53	131	3.571	228	22.02	350	11.438	224	73.38	178
20.6	22.37	37	37.36	204	24.308	180	28.44	109	3.742	171	25.57	355	11.619	181	71.79	159
30.5	22.63	26	39.67	231	24.440	132	27.57	87	3.850	108	29.09	352	11.752	133	70.39	140
Feb. 9.5	22.76	13	42.18	251	24.520	80	26.95	62	3.894	44	32.50	341	11.834	82	69.22	117
19.5	22.77	1	44.78	260	24.548	28	26.54	41	3.878	16	35.71	321	11.866	32	68.28	94
Mar. 1.4	22.66	11	47.32	254	24.528	20	26.34	20	3.804	74	38.65	294	11.851	15	67.58	70
11.4	22.45	21	49.73	241	24.466	62	26.31	3	3.681	123	41.25	260	11.794	57	67.09	49
21.4	22.14	31	51.91	218	24.369	97	26.43	12	3.516	165	43.48	223	11.703	91	66.81	28
31.4	21.76	38	53.76	185	24.244	125	26.67	24	3.319	197	45.31	183	11.585	118	66.70	11
Apr. 10.3	21.32	44	55.21	145	24.102	142	26.99	32	3.100	219	46.71	140	11.449	136	66.75	5
20.3	20.85	47	56.20	99	23.952	150	27.37	38	2.867	233	47.65	94	11.304	145	66.95	20
30.3	20.37	48	56.72	52	23.801	151	27.78	41	2.629	238	48.14	49	11.158	146	67.25	30
May 10.3	19.90	47	56.74	2	23.657	144	28.21	43	2.396	233	48.17	3	11.017	141	67.66	41
20.2	19.47	43	56.27	47	23.527	130	28.65	44	2.175	221	47.74	43	10.889	128	68.15	49
30.2	19.07	40	55.34	93	23.416	111	29.09	44	1.972	203	46.86	88	10.778	111	68.72	57
June 9.2	18.73	34	53.97	137	23.327	89	29.51	42	1.792	180	45.58	128	10.687	91	69.35	63
19.1	18.46	27	52.21	176	23.264	63	29.91	40	1.640	152	43.92	166	10.620	67	70.02	67
29.1	18.25	21	50.11	210	23.227	37	30.27	36	1.520	120	41.93	199	10.577	43	70.72	70
July 9.1	18.13	12	47.72	239	23.219	8	30.59	32	1.435	85	39.66	227	10.561	16	71.42	70
19.1	18.09	4	45.09	263	23.239	20	30.84	25	1.388	47	37.19	247	10.573	12	72.10	68
29.0	18.14	5	42.30	279	23.287	48	31.02	18	1.382	6	34.58	261	10.610	37	72.73	63
Aug. 8.0	18.26	12	39.38	292	23.363	76	31.11	9	1.419	37	31.93	265	10.677	67	73.28	55
18.0	18.46	20	36.41	297	23.468	105	31.07	4	1.499	80	29.33	260	10.770	93	73.71	43
28.0	18.74	28	33.44	297	23.600	132	30.88	19	1.624	125	26.85	248	10.892	122	73.98	27
Sept. 6.9	19.10	36	30.52	292	23.761	161	30.53	35	1.793	169	24.62	223	11.041	149	74.07	9
16.9	19.54	44	27.71	281	23.948	187	30.00	53	2.006	213	22.71	191	11.219	178	73.93	14
26.9	20.03	49	25.09	262	24.164	216	29.25	75	2.262	256	21.22	149	11.425	206	73.54	39
Oct. 6.8	20.58	55	22.67	242	24.405	241	28.31	94	2.554	292	20.21	101	11.658	233	72.88	66
16.8	21.19	61	20.53	214	24.672	267	27.16	115	2.882	328	19.76	45	11.917	259	71.96	92
26.8	21.85	66	18.73	180	24.959	287	25.83	133	3.236	354	19.88	12	12.197	280	70.76	120
Nov. 5.8	22.53	68	17.30	143	25.265	306	24.34	149	3.610	374	20.60	72	12.496	299	69.33	143
15.7	23.24	71	16.31	99	25.581	316	22.72	162	3.993	383	21.91	131	12.807	311	67.68	165
25.7	23.95	71	15.79	52	25.901	320	21.04	168	4.374	381	23.79	188	13.123	316	65.88	180
Dec. 5.7	24.64	69	15.75	4	26.218	317	19.34	170	4.742	368	26.16	237	13.435	312	63.97	191
15.6	25.30	66	16.23	48	26.520	302	17.70	164	5.085	343	28.95	279	13.734	299	62.03	194
25.6	25.90	60	17.19	96	26.800	280	16.15	155	5.391	306	32.09	314	14.011	277	60.11	192
35.6	26.43	53	18.62	143	27.047	247	14.75	140	5.650	259	35.46	337	14.256	245	58.28	183
Mean Place	17.278		52.65		21.729		41.70		0.963		18.77		9.107		84.36	
Sec δ, Tan δ	2.609		+2.410		1.019		+0.194		1.370		−0.936		1.001		+0.046	
$D_\psi\alpha$, $D_\omega\alpha$	+0.11		+0.12		+0.06		+0.01		+0.04		−0.04		+0.06		0.00	
$D_\psi\delta$, $D_\omega\delta$	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.7	

APPARENT PLACES OF STARS, 1919.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Argus. Mag. 1.8				83 Cancri. Mag. 6.6				ι Argus. Mag. 2.2				40 Lyncis. Mag. 3.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 12		−69 22		9 14		+18 2		9 14		−58 56		9 16		+34 43	
	s		″		s		″		s		″		s		″	
Jan. 0.6	22.69		56.18		30.019		45.36		58.049		2.52		9.920		53.26	
		35		365		242		96		287		364		275		6
10.6	23.04		59.83		30.261		44.40		58.336		6.16		10.195		53.20	—
		24		384		197		71		208		381		225		27
20.6	23.28		63.67		30.458		43.69		58.544		9.97		10.420		53.47	
		13		393		148		47		124		386		168		56
30.5	23.41		67.60		30.606		43.22		58.668		13.83		10.588		54.03	
		0		392		93		21		40		380		107		82
Feb. 9.5	23.41		71.52		30.699		43.01	—	58.708	—	17.63		10.695		54.85	
		10		379		41		1		41		367		46		102
19.5	23.31		75.31		30.740	—	43.02		58.667		21.30		10.741	—	55.87	
		22		359		9		21		117		343		12		116
Mar. 1.4	23.09		78.90		30.731		43.23		58.550		24.73		10.729		57.03	
		31		331		54		36		187		313		65		123
11.4	22.78		82.21		30.677		43.59		58.363		27.86		10.664		58.26	
		40		295		91		46		243		278		109		122
21.4	22.38		85.16		30.586		44.05		58.120		30.64		10.555		59.48	
		45		254		122		53		290		236		144		115
31.4	21.93		87.70		30.464		44.58		57.830		33.00		10.411		60.63	
		51		210		141		56		325		191		170		105
Apr. 10.3	21.42		89.80		30.323		45.14		57.505		34.91		10.241		61.68	
		55		160		152		56		349		141		183		88
20.3	20.87		91.40		30.171		45.70		57.156		36.32		10.058		62.56	
		57		108		154		52		361		92		188		68
30.3	20.30		92.48		30.017		46.22		56.795		37.24		9.870		63.24	
		57		55		149		47		361		40		183		47
May 10.3	19.73		93.03		29.868		46.69		56.434		37.64	—	9.687		63.71	
		56		0		137		40		352		12		166		22
20.2	19.17		93.03		29.731		47.09		56.082		37.52		9.521		63.93	
		54		53		119		33		335		63		149		0
30.2	18.63		92.50		29.612		47.42		55.747		36.89		9.372		63.93	
		50		104		97		23		307		112		122		24
June 9.2	18.13		91.46		29.515		47.65		55.440		35.77		9.250		63.69	
		45		153		72		16		272		157		95		45
19.1	17.68		89.93		29.443		47.81		55.168		34.20		9.155		63.24	
		39		197		47		7		232		199		62		66
29.1	17.29		87.96		29.396		47.88	—	54.936		32.21		9.093		62.58	
		31		235		17		3		184		235		29		85
July 9.1	16.98		85.61		29.379	—	47.85		54.752		29.86		9.064	—	61.73	
		24		269		11		13		130		264		4		102
19.1	16.74		82.92		29.390		47.72		54.622		27.22		9.068		60.71	
		16		291		39		25		72		284		39		119
29.0	16.58		80.01		29.429		47.47		54.550		24.38		9.107		59.52	
		5		307		68		35		9		297		73		133
Aug. 8.0	16.53	—	76.94		29.497		47.12		54.541	—	21.41		9.180		58.19	
		5		310		97		48		57		298		107		145
18.0	16.58		73.84		29.594		46.64		54.598		18.43		9.287		56.74	
		15		304		126		64		123		291		140		157
28.0	16.73		70.80		29.720		46.00		54.721		15.52		9.427		55.17	
		25		287		156		77		192		269		174		167
Sept. 6.9	16.98		67.93		29.876		45.23		54.913		12.83		9.601		53.50	
		36		258		184		93		258		241		208		173
16.9	17.34		65.35		30.060		44.30		55.171		10.42		9.809		51.77	
		45		220		213		109		321		201		240		180
26.9	17.79		63.15		30.273		43.21		55.492		8.41		10.049		49.97	
		53		171		241		125		379		152		272		183
Oct. 6.8	18.32		61.44		30.514		41.96		55.871		6.89		10.321		48.14	
		60		115		267		139		428		95		302		183
16.8	18.92		60.29		30.781		40.57		56.299		5.94		10.623		46.31	
		65		52		291		152		467		35		327		178
26.8	19.57		59.77	—	31.072		39.05		56.766		5.59	—	10.950		44.53	
		69		13		312		160		494		31		350		171
Nov. 5.8	20.26		59.90		31.384		37.45		57.260		5.90		11.300		42.82	
		70		80		324		165		505		96		366		156
15.7	20.96		60.70		31.708		35.80		57.765		6.86		11.666		41.26	
		69		147		331		162		503		160		373		138
25.7	21.65		62.17		32.039		34.18		58.268		8.46		12.039		39.88	
		65		206		329		158		482		218		371		114
Dec. 5.7	22.30		64.23		32.368		32.60		58.750		10.64		12.410		38.74	
		60		263		318		146		444		270		357		88
15.7	22.90		66.86		32.686		31.14		59.194		13.34		12.767		37.86	
		51		309		294		130		395		315		335		57
25.6	23.41		69.95		32.980		29.84		59.589		16.49		13.102		37.29	
		42		344		264		109		328		350		298		24
35.6	23.83		73.39		33.244		28.75		59.917		19.99		13.400		37.05	
Mean Place	19.002		60.47		27.838		57.98		55.198		5.68		7.530		69.16	
Sec δ, Tan δ	2.841		−2.659		1.052		+0.326		1.938		−1.661		1.217		+0.693	
$D_\psi\alpha$, $D_\omega\alpha$	+0.01		−0.13		+0.07		+0.02		+0.03		−0.08		+0.07		+0.03	
$D_\psi\delta$, $D_\omega\delta$	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Pyxidis. Mag. 4.9				α Hydræ. Mag. 2.2				h Ursæ Majoris. Mag. 3.8				d Ursæ Majoris. Mag. 4.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 17		−25 37		9 23		− 8 18		9 25		+63 24		9 27		+70 10	
	s		″		s		″		s		″		s		″	
Jan. 0.6	56.311		16.77		38.491		31.23		13.22		40.85		25.15		53.79	
10.6	56.538	227	19.76	299	38.721	230	33.54	231	13.66	44	42.16	131	25.73	58	55.35	156
20.6	56.718	180	22.73	297	38.910	189	35.74	220	14.03	37	43.87	171	26.19	46	57.33	198
30.5	56.847	129	25.63	290	39.048	138	37.77	203	14.30	27	45.92	205	26.53	34	59.65	232
Feb. 9.5	56.922	75	28.37	274	39.138	90	39.62	185	14.48	18	48.21	229	26.74	21	62.22	257
19.5	56.945	23 —	30.88	251	39.178	40 —	41.22	160	14.55	7 —	50.66	245	26.81	7 —	64.91	269
Mar. 1.5	56.917	28	33.15	227	39.171	7	42.57	135	14.50	5	53.15	249	26.73	8	67.63	272
11.4	56.847	70	35.10	195	39.123	48	43.66	109	14.36	14	55.57	242	26.55	18	70.24	261
21.4	56.739	108	36.74	164	39.038	85	44.50	84	14.14	22	57.82	225	26.25	30	72.66	242
31.4	56.604	135	38.03	129	38.926	112	45.08	58	13.85	29	59.81	199	25.85	40	74.78	212
Apr. 10.3	56.448	156	38.98	95	38.795	131	45.41	33	13.51	34	61.46	165	25.39	46	76.51	173
20.3	56.279	169	39.56	58	38.653	142	45.53	12 —	13.14	37	62.71	125	24.87	52	77.80	129
30.3	56.108	171	39.79	23 —	38.507	146	45.42	11	12.74	40	63.52	81	24.32	55	78.60	80
May 10.3	55.939	169	39.67	12	38.364	143	45.11	31	12.36	38	63.86	34 —	23.79	53	78.90	30 —
20.2	55.781	158	39.22	45	38.231	133	44.61	50	11.98	38	63.74	12	23.27	52	78.69	21
30.2	55.637	144	38.45	75	38.112	119	43.92	69	11.63	35	63.15	59	22.78	49	77.97	72
June 9.2	55.513	124	37.37	108	38.011	101	43.10	82	11.33	30	62.13	102	22.34	44	76.78	119
19.2	55.409	104	36.02	135	37.931	80	42.14	96	11.07	26	60.71	142	21.97	37	75.16	162
29.1	55.332	77	34.44	158	37.874	57	41.07	107	10.88	19	58.92	179	21.68	29	73.13	203
July 9.1	55.281	51	32.68	176	37.841	33	39.91	116	10.74	14	56.80	212	21.46	22	70.79	234
19.1	55.260	21 —	30.78	190	37.834	7 —	38.72	119	10.68	6	54.42	238	21.33	13	68.14	265
29.0	55.269	9	28.80	198	37.854	20	37.54	118	10.68	0	51.82	260	21.31	2 —	65.29	285
Aug. 8.0	55.309	40	26.81	199	37.901	47	36.41	113	10.74	6	49.06	276	21.37	6	62.26	303
18.0	55.383	74	24.89	192	37.977	76	35.37	104	10.88	14	46.19	287	21.51	14	59.13	313
28.0	55.490	107	23.12	177	38.082	105	34.48	89	11.07	19	43.26	293	21.75	24	55.97	316
Sept. 6.9	55.630	140	21.57	155	38.216	134	33.81	67	11.34	27	40.33	293	22.09	34	52.83	314
16.9	55.806	176	20.31	126	38.381	165	33.37	44	11.68	34	37.45	288	22.50	41	49.78	305
26.9	56.015	209	19.40	91	38.574	193	33.25	12 —	12.07	39	34.69	276	22.99	49	46.86	292
Oct. 6.9	56.255	240	18.92	48	38.798	224	33.45	20	12.51	44	32.09	260	23.55	56	44.14	272
16.8	56.526	271	18.90	2 —	39.050	252	34.01	56	13.01	50	29.71	238	24.19	64	41.70	244
26.8	56.824	298	19.38	48	39.325	275	34.92	91	13.55	54	27.63	208	24.88	69	39.58	212
Nov. 5.8	57.140	316	20.34	96	39.621	296	36.18	126	14.13	58	25.87	176	25.62	74	37.85	173
15.7	57.469	329	21.77	143	39.932	311	37.77	159	14.74	61	24.51	136	26.40	78	36.56	129
25.7	57.803	334	23.63	186	40.248	316	39.62	185	15.35	61	23.59	92	27.18	78	35.75	81
Dec. 5.7	58.131	328	25.89	226	40.562	314	41.71	209	15.97	62	23.14	45 —	27.96	78	35.46	29 —
15.7	58.443	312	28.45	256	40.865	303	43.94	223	16.57	60	23.19	5	28.71	75	35.70	24
25.6	58.730	287	31.23	278	41.146	281	46.25	231	17.12	55	23.74	55	29.42	71	36.47	77
35.6	58.981	251	34.16	293	41.396	250	48.56	231	17.62	50	24.77	103	30.05	63	37.75	128
Mean Place	54.186		13.95		36.448		24.48		9.712		61.11		20.888		74.68	
Sec δ, Tan δ	1.109		−0.480		1.011		−0.146		2.234		+1.998		2.950		+2.775	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.05		−0.02		+0.06		−0.01		+0.09		+0.10		+0.11		+0.15	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		+0.7		−0.3		+0.6		−0.3		+0.6		−0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Ursæ Majoris. Mag. 3.3				ψ Argus. Mag. 3.6				ξ Leonis. Mag. 5.1				10 Leonis Minoris. Mag. 4.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 27		+52 2		9 27		−40 6		9 27		+11 39		9 29		+36 44	
	s		″		s		″		s		″		s		″	
Jan. 0.6	29.761	353	31.33	74	32.656	252	42.43	335	36.994	246	21.65	136	18.365	293	71.92	4
10.6	30.114	289	32.07	113	32.908	197	45.78	344	37.240	203	20.29	113	18.658	242	71.88	31
20.6	30.403	219	33.20	147	33.105	140	49.22	344	37.443	155	19.16	89	18.900	185	72.19	64
30.5	30.622	141	34.67	175	33.245	78	52.66	335	37.598	104	18.27	64	19.085	126	72.83	90
Feb. 9.5	30.763	62	36.42	192	33.323	19	56.01	317	37.702	53	17.63	40	19.211	63	73.73	113
19.5	30.825	15	38.34	202	33.342	36	59.18	293	37.755	4	17.23	17	19.274	1	74.86	128
Mar. 1.5	30.810	85	40.36	202	33.306	86	62.11	262	37.759	41	17.06	1	19.275	52	76.14	136
11.4	30.725	149	42.38	192	33.220	129	64.73	228	37.718	79	17.07	18	19.223	98	77.50	136
21.4	30.576	198	44.30	174	33.091	163	67.01	191	37.639	108	17.25	30	19.125	138	78.86	131
31.4	30.378	235	46.04	150	32.928	188	68.92	150	37.531	128	17.55	38	18.987	167	80.17	117
Apr. 10.3	30.143	261	47.54	118	32.740	204	70.42	107	37.403	141	17.93	44	18.820	182	81.34	102
20.3	29.882	270	48.72	83	32.536	213	71.49	64	37.262	145	18.37	48	18.638	189	82.36	79
30.3	29.612	267	49.55	47	32.323	211	72.13	20	37.117	142	18.85	49	18.449	187	83.15	56
May 10.3	29.345	254	50.02	7	32.112	205	72.33	24	36.975	133	19.34	48	18.262	176	83.71	30
20.2	29.091	233	50.09	31	31.907	193	72.09	66	36.842	117	19.82	46	18.086	158	84.01	5
30.2	28.858	201	49.78	69	31.714	173	71.43	106	36.725	99	20.28	43	17.928	135	84.06	22
June 9.2	28.657	165	49.09	103	31.541	151	70.37	143	36.626	76	20.71	40	17.793	106	83.84	45
19.2	28.492	125	48.06	135	31.390	124	68.94	177	36.550	53	21.11	34	17.687	77	83.39	70
29.1	28.367	80	46.71	164	31.266	94	67.17	206	36.497	27	21.45	28	17.610	45	82.69	90
July 9.1	28.287	35	45.07	188	31.172	60	65.11	227	36.470	1	21.73	19	17.565	10	81.79	112
19.1	28.252	12	43.19	211	31.112	25	62.84	243	36.469	26	21.92	11	17.555	23	80.67	128
29.0	28.264	59	41.08	226	31.087	14	60.41	249	36.495	52	22.03	1	17.578	58	79.39	145
Aug. 8.0	28.323	106	38.82	239	31.101	54	57.92	249	36.547	81	22.04	13	17.636	92	77.94	160
18.0	28.429	153	36.43	249	31.155	95	55.43	239	36.628	109	21.91	28	17.728	128	76.34	172
28.0	28.582	200	33.94	253	31.250	139	53.04	217	36.737	137	21.63	44	17.856	163	74.62	182
Sept. 6.9	28.782	245	31.41	254	31.389	183	50.87	189	36.874	167	21.19	65	18.019	197	72.80	190
16.9	29.027	289	28.87	250	31.572	224	48.98	152	37.041	196	20.54	83	18.216	231	70.90	196
26.9	29.316	332	26.37	241	31.796	265	47.46	107	37.237	225	19.71	104	18.447	266	68.94	199
Oct. 6.9	29.648	371	23.96	228	32.061	302	46.39	56	37.462	253	18.67	125	18.713	299	66.95	197
16.8	30.019	408	21.68	208	32.363	331	45.83	1	37.715	277	17.42	142	19.012	327	64.98	193
26.8	30.427	437	19.60	185	32.694	357	45.84	58	37.992	299	16.00	159	19.339	352	63.05	183
Nov. 5.8	30.864	458	17.75	155	33.051	371	46.42	115	38.291	315	14.41	170	19.691	370	61.22	166
15.7	31.322	470	16.20	119	33.422	375	47.57	169	38.606	323	12.71	177	20.061	381	59.56	148
25.7	31.792	468	15.01	81	33.797	369	49.26	220	38.929	324	10.94	177	20.442	382	58.08	122
Dec. 5.7	32.260	454	14.20	38	34.166	349	51.46	263	39.253	314	9.17	173	20.824	372	56.86	92
15.7	32.714	427	13.82	5	34.515	319	54.09	298	39.567	294	7.44	161	21.196	348	55.94	59
25.6	33.141	383	13.87	49	34.834	278	57.07	322	39.861	265	5.83	146	21.544	316	55.35	23
35.6	33.524		14.36		35.112		60.29		40.126		4.37		21.860		55.12	
Mean Place	26.972		50.49		30.401		42.94		34.920		33.18		16.020		88.79	
Sec δ, Tan δ	1.626		+1.282		1.308		−0.843		1.021		+0.206		1.248		+0.747	
Dψα, Dωα	+0.08		+0.07		+0.05		−0.04		+0.06		+0.01		+0.07		+0.04	
Dψδ, Dωδ	−0.3		+0.6		−0.3		+0.6		−0.3		+0.6		−0.3		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	o Leonis. Mag. 3.8				θ Antliæ. Mag. 5.0				ε Leonis. Mag. 3.1				υ Argus. Mag. 3.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 36		+10 15		9 40		−27 23		9 41		+24 8		9 45		−64 41	
	s		″		s		″		s		″		s		″	
Jan. 0.6	51.803		30.30		37.487		54.99		17.513		37.27		7.76		40.60	
		250		146		250		299		272		77		38		349
10.6	52.053		28.84		37.737		57.98		17.785		36.50		8.14		44.09	
		210		123		204		303		230		48		30		373
20.6	52.263		27.61		37.941		61.01		18.015		36.02		8.44		47.82	
		163		100		154		298		180		16		20		386
30.5	52.426		26.61		38.095		63.99		18.195		35.86	—	8.64		51.68	
		112		74		101		285		126		10		11		391
Feb. 9.5	52.538		25.87		38.196		66.84		18.321		35.96		8.75		55.59	
		62		51		48		264		72		37		1		385
19.5	52.600		25.36		38.244	—	69.48		18.393		36.33		8.76	—	59.44	
		13		26		4		242		18		57		9		369
Mar. 1.5	52.613	—	25.10		38.240		71.90		18.411	—	36.90		8.67		63.13	
		32		6		47		213		30		73		16		345
11.4	52.581		25.04	—	38.193		74.03		18.381		37.63		8.51		66.58	
		70		10		88		182		73		83		24		315
21.4	52.511		25.14		38.105		75.85		18.308		38.46		8.27		69.73	
		100		26		119		148		107		87		31		279
31.4	52.411		25.40		37.986		77.33		18.201		39.33		7.96		72.52	
		123		35		142		113		131		87		35		237
Apr. 10.4	52.288		25.75		37.844		78.46		18.070		40.20		7.61		74.89	
		135		43		157		79		148		81		39		191
20.3	52.153		26.18		37.687		79.25		17.922		41.01		7.22		76.80	
		142		47		166		42		155		73		42		143
30.3	52.011		26.65		37.521		79.67		17.767		41.74		6.80		78.23	
		139		50		166		6		154		62		43		89
May 10.3	51.872		27.15		37.355		79.73	—	17.613		42.36		6.37		79.12	
		132		51		160		28		147		48		43		38
20.2	51.740		27.66		37.195		79.45		17.466		42.84		5.94		79.50	—
		118		50		150		62		133		34		43		15
30.2	51.622		28.16		37.045		78.83		17.333		43.18		5.51		79.35	
		102		47		135		93		114		18		40		68
June 9.2	51.520		28.63		36.910		77.90		17.219		43.36		5.11		78.67	
		80		44		116		122		93		3		37		118
19.2	51.440		29.07		36.794		76.68		17.126		43.39	—	4.74		77.49	
		58		40		94		148		67		13		34		164
29.1	51.382		29.47		36.700		75.20		17.059		43.26		4.40		75.85	
		34		35		70		170		43		29		28		207
July 9.1	51.348		29.82		36.630		73.50		17.016		42.97		4.12		73.78	
		10		27		43		185		14		43		23		241
19.1	51.338	—	30.09		36.587		71.65		17.002	—	42.54		3.89		71.37	
		18		18		14		196		13		58		17		271
29.1	51.356		30.27		36.573	—	69.69		17.015		41.96		3.72		68.66	
		43		8		17		199		42		75		8		291
Aug. 8.0	51.399		30.35	—	36.590		67.70		17.057		41.21		3.64		65.75	
		71		6		48		196		72		88		1		301
18.0	51.470		30.29		36.638		65.74		17.129		40.33		3.63	—	62.74	
		98		22		83		186		103		103		7		301
28.0	51.568		30.07		36.721		63.88		17.232		39.30		3.70		59.73	
		128		38		119		165		132		120		15		291
Sept. 6.9	51.696		29.69		36.840		62.23		17.364		38.10		3.85		56.82	
		158		58		156		140		165		133		24		267
16.9	51.854		29.11		36.996		60.83		17.529		36.77		4.09		54.15	
		186		79		191		105		196		148		33		236
26.9	52.040		28.32		37.187		59.78		17.725		35.29		4.42		51.79	
		218		100		227		65		228		160		40		193
Oct. 6.9	52.258		27.32		37.414		59.13		17.953		33.69		4.82		49.86	
		246		123		262		19		259		171		47		140
16.8	52.504		26.09		37.676		58.94	—	18.212		31.98		5.29		48.46	
		271		142		289		28		287		177		53		83
26.8	52.775		24.67		37.965		59.22		18.499		30.21		5.82		47.63	
		294		159		316		78		312		181		57		19
Nov. 5.8	53.069		23.08		38.281		60.00		18.811		28.40		6.39		47.44	—
		313		172		332		128		330		180		59		48
15.8	53.382		21.36		38.613		61.28		19.141		26.60		6.98		47.92	
		322		181		340		172		343		172		60		112
25.7	53.704		19.55		38.953		63.00		19.484		24.88		7.58		49.04	
		324		183		340		214		346		160		59		176
Dec. 5.7	54.028		17.72		39.293		65.14		19.830		23.28		8.17		50.80	
		315		180		327		248		338		143		56		235
15.7	54.343		15.92		39.620		67.62		20.168		21.85		8.73		53.15	
		297		171		304		273		322		119		50		282
25.6	54.640		14.21		39.924		70.35		20.490		20.66		9.23		55.97	
		271		154		272		290		292		94		43		326
35.6	54.911		12.67		40.196		73.25		20.782		19.72		9.66		59.23	
Mean Place	49.779		41.67		35.426		53.09		15.414		52.02		4.691		46.09	
Sec δ, Tan δ	1.016		+0.181		1.126		−0.518		1.096		+0.448		2.340		−2.116	
$D_{\psi}a$, $D_{\omega}a$	+0.06		+0.01		+0.05		−0.03		+0.07		+0.02		+0.03		−0.12	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		+0.6		−0.3		+0.6		−0.3		+0.6		−0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	υ Ursæ Majoris. Mag. 3.9				6 Sextantis. Mag. 6.0				μ Leonis. Mag. 4.1				Groombridge 1586. Mag. 6.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 9 45		° ′ +59 24		h m 9 47		° ′ − 3 51		h m 9 48		° ′ +26 22		h m 9 51		° ′ +73 15	
	s		″		s		″		s		″		s		″	
Jan. 0.6	17.572		52.78		11.134		55.03		11.667		65.32		14.76		33.14	
10.6	18.005	433	53.69	91	11.384	250	57.16	213	11.950	283	64.61	71	15.47	71	34.56	142
20.6	18.368	363	55.06	137	11.594	210	59.17	201	12.189	239	64.24	37	16.06	59	36.45	189
30.6	18.649	281	56.81	175	11.759	165	61.00	183	12.378	189	64.17	7 —	16.52	46	38.74	229
Feb. 9.5	18.840	191	58.87	206	11.875	116	62.62	162	12.513	135	64.40	23	16.81	29	41.33	259
19.5	18.939	99	61.13	226	11.941	66	64.01	139	12.593	80	64.88	48	16.96	15	44.10	277
Mar. 1.5	18.944	5 —	63.50	237	11.960	19 —	65.13	112	12.618	25 —	65.59	71	16.96	0	46.95	285
11.4	18.863	81	65.87	237	11.936	24	66.02	89	12.595	23	66.44	85	16.79	17	49.75	280
21.4	18.705	158	68.15	228	11.874	62	66.66	64	12.526	69	67.40	96	16.49	30	52.38	263
31.4	18.482	223	70.21	206	11.783	91	67.08	42	12.422	104	68.39	99	16.08	41	54.74	236
Apr. 10.4	18.208	274	72.00	179	11.669	114	67.28	20	12.292	130	69.36	97	15.56	52	56.75	201
20.3	17.898	310	73.45	145	11.541	128	67.29	1 —	12.144	148	70.27	91	14.97	59	58.31	156
30.3	17.568	330	74.50	105	11.406	135	67.12	17	11.986	158	71.08	81	14.34	63	59.40	109
May 10.3	17.233	335	75.11	61	11.270	136	66.79	33	11.828	158	71.74	66	13.70	64	59.97	57
20.2	16.907	326	75.28	17 —	11.141	129	66.32	47	11.677	151	72.25	51	13.05	65	59.99	2 —
30.2	16.602	305	75.01	27	11.023	118	65.73	59	11.539	138	72.60	35	12.44	61	59.49	50
June 9.2	16.326	276	74.30	71	10.918	105	65.02	71	11.419	120	72.75	15 —	11.88	56	58.49	100
19.2	16.090	236	73.18	112	10.830	88	64.22	80	11.319	100	72.74	1	11.38	50	57.01	148
29.1	15.899	191	71.69	149	10.764	66	63.35	87	11.244	75	72.53	21	10.96	42	55.10	191
July 9.1	15.759	140	69.86	183	10.718	46	62.44	91	11.194	50	72.18	35	10.62	34	52.80	230
19.1	15.671	88	67.72	214	10.696	22 —	61.51	93	11.172	22 —	71.64	54	10.38	24	50.17	263
29.1	15.639	32 —	65.34	238	10.698	2	60.60	91	11.177	5	70.92	72	10.24	14	47.28	289
Aug. 8.0	15.664	25	62.75	259	10.727	29	59.75	85	11.212	35	70.06	86	10.23	1 —	44.16	312
18.0	15.746	82	60.01	274	10.781	54	59.01	74	11.278	66	69.04	102	10.30	7	40.92	324
28.0	15.887	141	57.17	284	10.865	84	58.40	61	11.373	95	67.84	120	10.48	18	37.59	333
Sept. 6.9	16.085	198	54.28	289	10.978	113	57.98	42	11.500	127	66.51	133	10.77	29	34.24	335
16.9	16.339	254	51.39	289	11.121	143	57.80	18 —	11.659	159	65.04	147	11.17	40	30.94	330
26.9	16.650	311	48.55	284	11.296	175	57.88	8	11.851	192	63.43	161	11.66	49	27.76	318
Oct. 6.9	17.015	365	45.82	273	11.502	206	58.27	39	12.076	225	61.71	172	12.25	59	24.78	298
16.8	17.431	416	43.27	255	11.737	235	58.98	71	12.333	257	59.90	181	12.92	67	22.03	275
26.8	17.892	461	40.94	233	12.001	264	59.99	101	12.619	286	58.03	187	13.68	76	19.61	242
Nov. 5.8	18.392	500	38.91	203	12.288	287	61.32	133	12.932	313	56.15	188	14.50	82	17.58	203
15.8	18.923	531	37.22	169	12.595	307	62.93	161	13.265	333	54.31	184	15.36	86	15.99	159
25.7	19.471	548	35.94	128	12.912	317	64.77	184	13.611	346	52.55	176	16.26	90	14.89	110
Dec. 5.7	20.023	552	35.11	83	13.232	320	66.79	202	13.962	351	50.95	160	17.18	92	14.32	57 —
15.7	20.563	540	34.77	34 —	13.544	312	68.93	214	14.307	345	49.53	142	18.05	87	14.33	1
25.6	21.075	512	34.93	16	13.839	295	71.12	219	14.636	329	48.38	115	18.89	84	14.90	57
35.6	21.541	466	35.57	64	14.107	268	73.28	216	14.937	301	47.52	86	19.65	76	16.00	110
Mean Place	14.613		73.85		9.185		47.18		9.588		80.77		10.444		55.72	
Sec δ, Tan δ	1.965		+1.692		1.002		−0.068		1.116		+0.496		3.472		+3.325	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.09		+0.09		+0.06		0.00		+0.07		+0.03		+0.11		+0.19	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		+0.6		−0.3		+0.5		−0.3		+0.5		−0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	19 Leonis Minoris. Mag. 5.2				φ Argus. Mag. 3.7				π Leonis. Mag. 4.9				η Leonis. Mag. 3.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 9 52		° ′ +41 25		h m 9 54		° ′ −54 10		h m 9 55		° ′ + 8 25		h m 10 2		° ′ +17 8	
	s		″		s		″		s		″		s		″	
Jan. 0.6	46.029		72.80		3.450		51.08		57.991		49.12		56.968		75.99	
10.6	46.358	329	72.81	1	3.778	328	54.49	341	58.254	263	47.52	160	57.246	278	74.77	122
20.6	46.636	278	73.23	42	4.041	263	58.10	361	58.478	224	46.12	140	57.484	238	73.81	96
30.6	46.858	222	74.01	78	4.235	194	61.84	374	58.657	179	44.97	115	57.677	193	73.15	66
Feb. 9.5	47.018	160	75.12	111	4.355	120	65.58	374	58.788	131	44.07	90	57.820	143	72.77	38
19.5	47.111	93	76.48	136	4.401	46 —	69.23	365	58.868	80	43.44	63	57.910	90	72.67	10 —
Mar. 1.5	47.141	30 —	78.02	154	4.378	23	72.72	349	58.899	31 —	43.04	40	57.950	40 —	72.82	15
11.4	47.110	31	79.68	166	4.291	87	75.97	325	58.886	13	42.87	17 —	57.944	6	73.16	34
21.4	47.027	83	81.34	166	4.145	146	78.91	294	58.834	52	42.89	2	57.896	48	73.67	51
31.4	46.899	128	82.93	159	3.953	192	81.49	258	58.750	84	43.09	20	57.814	82	74.28	61
Apr. 10.4	46.737	162	84.41	148	3.724	229	83.67	218	58.642	108	43.40	31	57.704	110	74.98	70
20.3	46.551	186	85.68	127	3.465	259	85.40	173	58.517	125	43.80	40	57.577	127	75.69	71
30.3	46.353	198	86.72	104	3.188	277	86.66	126	58.384	133	44.27	47	57.440	137	76.38	69
May 10.3	46.151	202	87.47	75	2.901	287	87.44	78	58.250	134	44.79	52	57.301	139	77.03	65
20.3	45.956	195	87.94	47	2.613	288	87.72	28 —	58.120	130	45.33	54	57.165	136	77.62	59
30.2	45.774	182	88.08	14 —	2.332	281	87.51	21	58.002	118	45.87	54	57.039	126	78.13	51
June 9.2	45.613	161	87.91	17	2.065	267	86.81	70	57.896	106	46.40	53	56.927	112	78.54	41
19.2	45.476	137	87.45	46	1.820	245	85.65	116	57.807	89	46.91	51	56.831	96	78.84	30
29.1	45.367	109	86.68	77	1.602	218	84.06	159	57.739	68	47.38	47	56.756	75	79.02	18
July 9.1	45.291	76	85.66	102	1.416	186	82.08	198	57.691	48	47.81	43	56.701	55	79.09	7 —
19.1	45.248	43	84.38	128	1.270	146	79.79	229	57.667	24	48.16	35	56.671	30	79.04	5
29.1	45.240	8 —	82.88	150	1.169	101	77.22	257	57.666	1 —	48.42	26	56.664	7 —	78.83	21
Aug. 8.0	45.268	28	81.18	170	1.117	52 —	74.49	273	57.691	25	48.58	16	56.685	21	78.49	34
18.0	45.332	64	79.31	187	1.120	3	71.67	282	57.741	50	48.61	3 —	56.731	46	78.00	49
28.0	45.433	101	77.29	202	1.178	58	68.87	280	57.820	79	48.48	13	56.806	75	77.33	67
Sept. 7.0	45.571	138	75.14	215	1.297	119	66.18	269	57.928	108	48.16	32	56.912	106	76.49	84
16.9	45.749	178	72.91	223	1.476	179	63.72	246	58.066	138	47.65	51	57.047	135	75.48	101
26.9	45.966	217	70.63	228	1.717	241	61.58	214	58.236	170	46.91	74	57.216	169	74.27	121
Oct. 6.9	46.221	255	68.33	230	2.014	297	59.86	172	58.438	202	45.95	96	57.417	201	72.89	138
16.8	46.514	293	66.06	227	2.365	351	58.66	120	58.669	231	44.75	120	57.650	233	71.34	155
26.8	46.840	326	63.86	220	2.762	397	58.01	65	58.930	261	43.34	141	57.914	264	69.64	170
Nov. 5.8	47.200	360	61.80	206	3.194	432	57.98	3 —	59.216	286	41.73	161	58.204	290	67.84	180
15.8	47.581	381	59.92	188	3.650	456	58.56	58	59.524	308	39.98	175	58.518	314	65.97	187
25.7	47.977	396	58.28	164	4.118	468	59.79	123	59.844	320	38.11	187	58.846	328	64.08	189
Dec. 5.7	48.381	404	56.94	134	4.580	462	61.60	181	60.168	324	36.19	192	59.181	335	62.24	184
15.7	48.779	398	55.94	100	5.022	442	63.97	237	60.489	321	34.29	190	59.513	332	60.50	174
25.7	49.160	381	55.33	61	5.431	409	66.79	282	60.794	305	32.46	183	59.831	318	58.93	157
35.6	49.509	349	55.12	21	5.792	361	69.99	320	61.075	281	30.77	169	60.125	294	57.57	136
Mean Place	43.766		91.54		0.964		55.33		56.064		60.29		55.041		89.56	
Sec δ, Tan δ	1.334		+0.883		1.709		−1.386		1.011		+0.148		1.046		+0.309	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.07		+0.05		+0.04		−0.08		+0.06		+0.01		+0.06		+0.02	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		+0.5		−0.3		+0.5		−0.3		+0.5		−0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Leonis. (*Regulus.*) Mag. 1.3				λ Hydræ. Mag. 3.8				q Velorum. Mag. 4.1				32 Ursæ Majoris. Mag. 5.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	10 4		+12 21		10 6		−11 57		10 11		−41 43		10 12		+65 30	
	s		″		s		″		s		″		s		″	
Jan. 0.6	5.516	272	36.61	145	40.230	263	16.86	246	22.021	303	10.49	317	13.20	54	23.97	89
10.6	5.788	235	35.16	121	40.493	225	19.32	240	22.324	255	13.66	334	13.74	47	24.86	140
20.6	6.023	189	33.95	95	40.718	181	21.72	228	22.579	199	17.00	342	14.21	38	26.26	184
30.6	6.212	139	33.00	66	40.899	132	24.00	209	22.778	140	20.42	340	14.59	28	28.10	220
Feb. 9.5	6.351	90	32.34	42	41.031	84	26.09	189	22.918	81	23.82	330	14.87	17	30.30	246
19.5	6.441	40	31.92	15	41.115	35	27.98	163	22.999	24	27.12	311	15.04	5	32.76	263
Mar. 1.5	6.481	— 6	31.77	— 6	41.150	— 8	29.61	139	23.023	— 30	30.23	289	15.09	— 5	35.39	266
11.5	6.475	45	31.83	26	41.142	46	31.00	111	22.993	77	33.12	258	15.04	14	38.05	258
21.4	6.430	80	32.09	38	41.096	80	32.11	85	22.916	117	35.70	225	14.90	24	40.63	241
31.4	6.350	104	32.47	49	41.016	102	32.96	58	22.799	148	37.95	189	14.66	32	43.04	213
Apr. 10.4	6.246	123	32.96	56	40.914	122	33.54	34	22.651	173	39.84	148	14.34	36	45.17	177
20.3	6.123	132	33.52	59	40.792	130	33.88	10	22.478	189	41.32	107	13.98	40	46.94	137
30.3	5.991	135	34.11	59	40.662	134	33.98	— 12	22.289	198	42.39	65	13.58	42	48.31	90
May 10.3	5.856	131	34.70	57	40.528	132	33.86	35	22.091	200	43.04	21	13.16	42	49.21	42
20.3	5.725	122	35.27	54	40.396	125	33.51	54	21.891	197	43.25	— 22	12.74	41	49.63	— 7
30.2	5.603	110	35.81	49	40.271	114	32.97	73	21.694	187	43.03	63	12.33	37	49.56	56
June 9.2	5.493	94	36.30	42	40.157	100	32.24	89	21.507	173	42.40	104	11.96	34	49.00	103
19.2	5.399	74	36.72	36	40.057	83	31.35	102	21.334	153	41.36	140	11.62	30	47.97	146
29.2	5.325	54	37.08	25	39.974	64	30.33	113	21.181	131	39.96	174	11.32	24	46.51	185
July 9.1	5.271	30	37.33	17	39.910	43	29.20	121	21.050	103	38.22	201	11.08	19	44.66	223
19.1	5.241	8	37.50	6	39.867	19	27.99	124	20.947	72	36.21	223	10.89	12	42.43	253
29.1	5.233	— 18	37.56	— 7	39.848	— 5	26.75	123	20.875	38	33.98	237	10.77	5	39.90	277
Aug. 8.0	5.251	43	37.49	22	39.853	33	25.52	114	20.837	0	31.61	243	10.72	— 2	37.13	298
18.0	5.294	72	37.27	37	39.886	62	24.38	104	20.837	43	29.18	242	10.74	10	34.15	312
28.0	5.366	101	36.90	55	39.948	91	23.34	86	20.880	88	26.76	229	10.84	17	31.03	319
Sept. 7.0	5.467	132	36.35	76	40.039	125	22.48	62	20.968	134	24.47	208	11.01	23	27.84	322
16.9	5.599	164	35.59	95	40.164	159	21.86	34	21.102	182	22.39	178	11.24	31	24.62	317
26.9	5.763	197	34.64	117	40.323	191	21.52	3	21.284	228	20.61	140	11.55	37	21.45	306
Oct. 6.9	5.960	227	33.47	136	40.514	226	21.49	— 34	21.512	273	19.21	92	11.92	45	18.39	289
16.9	6.187	259	32.11	156	40.740	257	21.83	71	21.785	314	18.29	42	12.37	51	15.50	266
26.8	6.446	284	30.55	171	40.997	283	22.54	109	22.099	348	17.87	— 14	12.88	56	12.84	235
Nov. 5.8	6.730	308	28.84	182	41.280	306	23.63	143	22.447	372	18.01	71	13.44	61	10.49	197
15.8	7.038	322	27.02	189	41.586	319	25.06	177	22.819	388	18.72	128	14.05	64	8.52	154
25.7	7.360	329	25.13	190	41.905	325	26.83	203	23.207	391	20.00	180	14.69	66	6.98	104
Dec. 5.7	7.689	326	23.23	185	42.230	321	28.86	224	23.598	382	21.80	228	15.35	65	5.94	52
15.7	8.015	311	21.38	174	42.551	305	31.10	237	23.980	360	24.08	269	16.00	62	5.42	— 4
25.7	8.326	288	19.64	155	42.856	281	33.47	244	24.340	326	26.77	301	16.62	59	5.46	58
35.6	8.614		18.09		43.137		35.91		24.666		29.78		17.21		6.04	
Mean Place	3.617		48.93		38.353		11.34		19.913		12.88		10.218		47.09	
Sec δ, Tan δ	1.024		+0.219		1.022		−0.212		1.340		−0.892		2.412		+2.195	
Dψα, Dωα	+0.06		+0.01		+0.06		−0.01		+0.05		−0.05		+0.09		+0.13	
Dψδ, Dωδ	−0.3		+0.5		−0.3		+0.5		−0.4		+0.5		−0.4		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Leonis. Mag. 3.6				λ Ursæ Majoris. Mag. 3.5				γ Leonis pr. Mag. 2.6				μ Ursæ Majoris. Mag. 3.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 10 12		° ′ +23 48		h m 10 12		° ′ +43 18		h m 10 15		° ′ +20 14		h m 10 17		° ′ +41 53	
	s		″		s		″		s		″		s		″	
Jan. 0.7	13.234	294	61.92	97	15.297	350	50.27	5	32.431	291	51.78	112	32.686	349	66.88	16
10.6	13.528	255	60.95	63	15.647	304	50.22	— 38	32.722	253	50.66	85	33.035	304	66.72	— 27
20.6	13.783	209	60.32	31	15.951	248	50.60	78	32.975	208	49.81	54	33.339	250	66.99	67
30.6	13.992	158	60.01	0	16.199	186	51.38	114	33.183	159	49.27	22	33.589	189	67.66	104
Feb. 9.5	14.150	105	60.01	30	16.385	120	52.52	142	33.342	107	49.05	— 6	33.778	126	68.70	134
19.5	14.255	51	60.31	54	16.505	55	53.94	166	33.449	55	49.11	32	33.904	61	70.04	158
Mar. 1.5	14.306	2	60.85	74	16.560	— 9	55.60	177	33.504	6	49.43	53	33.965	— 1	71.62	172
11.5	14.308	— 43	61.59	88	16.551	65	57.37	182	33.510	— 37	49.96	70	33.964	56	73.34	177
21.4	14.265	80	62.47	96	16.486	113	59.19	178	33.473	73	50.66	79	33.908	103	75.11	176
31.4	14.185	109	63.43	98	16.373	152	60.97	165	33.400	101	51.45	85	33.805	141	76.87	164
Apr. 10.4	14.076	129	64.41	96	16.221	179	62.62	147	33.299	123	52.30	85	33.664	171	78.51	148
20.4	13.947	141	65.37	89	16.042	197	64.09	122	33.176	134	53.15	82	33.493	187	79.99	125
30.3	13.806	146	66.26	78	15.845	204	65.31	94	33.042	139	53.97	75	33.306	197	81.24	99
May 10.3	13.660	145	67.04	65	15.641	203	66.25	62	32.903	138	54.72	64	33.109	195	82.23	68
20.3	13.515	136	67.69	50	15.438	194	66.87	29	32.765	131	55.36	54	32.914	188	82.91	35
30.2	13.379	122	68.19	34	15.244	178	67.16	— 4	32.634	117	55.90	41	32.726	174	83.26	4
June 9.2	13.257	107	68.53	15	15.066	155	67.12	37	32.517	103	56.31	25	32.552	152	83.30	— 30
19.2	13.150	87	68.68	— 1	14.911	129	66.75	70	32.414	85	56.56	12	32.400	129	83.00	61
29.2	13.063	64	68.67	19	14.782	102	66.05	100	32.329	63	56.68	— 4	32.271	102	82.39	91
July 9.1	12.999	42	68.48	37	14.680	68	65.05	129	32.266	42	56.64	21	32.169	70	81.48	119
19.1	12.957	16	68.11	53	14.612	35	63.76	154	32.224	17	56.43	35	32.099	40	80.29	145
29.1	12.941	— 10	67.58	73	14.577	1	62.22	177	32.207	— 8	56.08	52	32.059	6	78.84	169
Aug. 8.0	12.951	38	66.85	89	14.576	— 36	60.45	197	32.215	36	55.56	69	32.053	— 30	77.15	189
18.0	12.989	68	65.96	106	14.612	75	58.48	215	32.251	64	54.87	86	32.083	67	75.26	209
28.0	13.057	98	64.90	125	14.687	115	56.33	229	32.315	93	54.01	104	32.150	106	73.17	222
Sept. 7.0	13.155	132	63.65	140	14.802	154	54.04	239	32.408	126	52.97	123	32.256	145	70.95	234
16.9	13.287	165	62.25	158	14.956	196	51.65	246	32.534	159	51.74	140	32.401	185	68.61	243
26.9	13.452	200	60.67	171	15.152	238	49.19	249	32.693	192	50.34	157	32.586	228	66.18	247
Oct. 6.9	13.652	233	58.96	183	15.390	278	46.70	247	32.885	227	48.77	171	32.814	268	63.71	247
16.9	13.885	266	57.13	193	15.668	318	44.23	240	33.112	259	47.06	184	33.082	307	61.24	241
26.8	14.151	296	55.20	198	15.986	352	41.83	227	33.371	288	45.22	192	33.389	342	58.83	230
Nov. 5.8	14.447	320	53.22	199	16.338	381	39.56	207	33.659	314	43.30	197	33.731	371	56.53	211
15.8	14.767	337	51.23	192	16.719	402	37.49	182	33.973	331	41.33	195	34.102	394	54.42	189
25.7	15.104	347	49.31	181	17.121	413	35.67	151	34.304	340	39.38	188	34.496	405	52.53	159
Dec. 5.7	15.451	345	47.50	163	17.534	411	34.16	114	34.644	340	37.50	174	34.901	405	50.94	122
15.7	15.796	334	45.87	142	17.945	398	33.02	73	34.984	329	35.76	155	35.306	393	49.72	83
25.7	16.130	310	44.45	112	18.343	371	32.29	31	35.313	307	34.21	130	35.699	367	48.89	41
35.6	16.440		43.33		18.714		31.98		35.620		32.91		36.066		48.48	
Mean Place	11.322		77.39		13.157		70.15		30.561		66.41		30.616		86.65	
Sec δ, Tan δ	1.093		+0.441		1.374		+0.943		1.066		+0.369		1.344		+0.897	
Dψα, Dωα	+0.07		+0.03		+0.07		+0.06		+0.07		+0.02		+0.07		+0.05	
Dψδ, Dωδ	−0.4		+0.5		−0.4		+0.5		−0.4		+0.4		−0.4		+0.4	

Washington Mean Time.	30 H. Ursæ Majoris. Mag. 4.9				μ Hydræ. Mag. 4.1				31 Leonis Minoris. Mag. 4.4				α Antliæ. Mag. 4.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 10 18		° ′ +65 57		h m 10 22		° ′ −16 25		h m 10 23		° ′ +37 6		h m 10 23		° ′ −30 39	
	s		″		s		″		s		″		s		″	
Jan. 0.7	21.79	56	72.53	85	12.162	278	24.38	258	14.292	334	62.69	43	28.515	292	19.19	293
10.6	22.35	49	73.38	136	12.440	239	26.96	256	14.626	293	62.26	2	28.807	250	22.12	304
20.6	22.84	40	74.74	181	12.679	195	29.52	248	14.919	243	62.24	38	29.057	203	25.16	304
30.6	23.24	30	76.55	219	12.874	148	32.00	235	15.162	186	62.62	75	29.260	152	28.20	298
Feb. 9.5	23.54	17	78.74	246	13.022	99	34.35	213	15.348	127	63.37	106	29.412	99	31.18	286
19.5	23.71	7	81.20	265	13.121	51	36.48	192	15.475	67	64.43	130	29.511	47	34.04	266
Mar. 1.5	23.78	3	83.85	268	13.172	6	38.40	166	15.542	10	65.73	148	29.558	1	36.70	242
11.5	23.75	14	86.53	262	13.178	34	40.06	139	15.552	43	67.21	157	29.557	44	39.12	213
21.4	23.61	24	89.15	246	13.144	67	41.45	111	15.509	87	68.78	159	29.513	81	41.25	183
31.4	23.37	30	91.61	219	13.077	93	42.56	84	15.422	124	70.37	153	29.432	110	43.08	149
Apr. 10.4	23.07	36	93.80	185	12.984	113	43.40	55	15.298	150	71.90	140	29.322	131	44.57	114
20.4	22.71	41	95.65	143	12.871	126	43.95	29	15.148	168	73.30	121	29.191	146	45.71	79
30.3	22.30	42	97.08	98	12.745	131	44.24	4	14.980	176	74.51	100	29.045	154	46.50	44
May 10.3	21.88	43	98.06	49	12.614	133	44.28	22	14.804	176	75.51	73	28.891	158	46.94	8
20.3	21.45	41	98.55	2	12.481	128	44.06	45	14.628	170	76.24	47	28.733	154	47.02	28
30.2	21.04	40	98.53	49	12.353	120	43.61	68	14.458	157	76.71	16	28.579	148	46.74	62
June 9.2	20.64	36	98.04	98	12.233	109	42.93	87	14.301	140	76.87	13	28.431	136	46.12	94
19.2	20.28	31	97.06	140	12.124	94	42.06	105	14.161	118	76.74	40	28.295	121	45.18	123
29.2	19.97	25	95.66	183	12.030	77	41.01	121	14.043	95	76.34	70	28.174	103	43.95	148
July 9.1	19.72	20	93.83	220	11.953	58	39.80	130	13.948	67	75.64	95	28.071	82	42.47	171
19.1	19.52	14	91.63	251	11.895	36	38.50	137	13.881	39	74.69	120	27.989	57	40.76	187
29.1	19.38	7	89.12	277	11.859	11	37.13	139	13.842	8	73.49	143	27.932	28	38.89	196
Aug. 8.1	19.31	0	86.35	299	11.848	16	35.74	136	13.834	24	72.06	164	27.904	2	36.93	199
18.0	19.31	8	83.36	313	11.864	44	34.38	126	13.858	59	70.42	183	27.906	36	34.94	195
28.0	19.39	15	80.23	323	11.908	76	33.12	108	13.917	92	68.59	199	27.942	74	32.99	183
Sept. 7.0	19.54	23	77.00	326	11.984	111	32.04	88	14.009	131	66.60	214	28.016	113	31.16	160
16.9	19.77	30	73.74	322	12.095	145	31.16	60	14.140	170	64.46	225	28.129	154	29.56	133
26.9	20.07	37	70.52	313	12.240	181	30.56	27	14.310	209	62.21	233	28.283	195	28.23	98
Oct. 6.9	20.44	44	67.39	296	12.421	218	30.29	10	14.519	248	59.88	236	28.478	234	27.25	54
16.9	20.88	50	64.43	273	12.639	252	30.39	48	14.767	285	57.52	235	28.712	273	26.71	9
26.8	21.38	56	61.70	242	12.891	281	30.87	89	15.052	320	55.17	229	28.985	306	26.62	40
Nov. 5.8	21.94	61	59.28	204	13.172	306	31.76	129	15.372	350	52.88	216	29.291	331	27.02	91
15.8	22.55	65	57.24	161	13.478	322	33.05	166	15.722	370	50.72	197	29.622	349	27.93	139
25.8	23.20	66	55.63	112	13.800	331	34.71	196	16.092	383	48.75	171	29.971	356	29.32	184
Dec. 5.7	23.86	66	54.51	58	14.131	328	36.67	224	16.475	385	47.04	142	30.327	351	31.16	224
15.7	24.52	64	53.93	3	14.459	316	38.91	241	16.860	375	45.62	105	30.678	338	33.40	256
25.7	25.16	60	53.90	53	14.775	293	41.32	254	17.235	351	44.57	66	31.016	309	35.96	279
35.6	25.76		54.43		15.068		43.86		17.586		43.91		31.325		38.75	
Mean Place	18.879		95.99		10.338		20.32		12.334		81.62		26.600		19.18	
Sec δ, Tan δ	2.456		+2.243		1.043		−0.295		1.254		+0.757		1.162		−0.593	
$D_\psi \alpha$, $D_\omega \alpha$	+0.09		+0.14		+0.06		−0.02		+0.07		+0.05		+0.05		−0.04	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**36 Ursæ Majoris.** Mag. 4.8				**9 H. Draconis.** Mag. 5.0				**ρ Leonis.** Mag. 3.8				**33 Sextantis.** Mag. 6.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	10 25		+56 23		10 28		+76 7		10 28		+ 9 42		10 37		− 1 18	
	s		″		s		″		s		″		s		″	
Jan. 0.7	29.618	445	24.36	38	19.02	91	26.46	108	34.642	286	74.17	164	18.652	285	63.00	208
10.6	30.063	390	24.74	89	19.93	79	27.54	163	34.928	251	72.53	143	18.937	250	65.08	196
20.6	30.453	322	25.63	134	20.72	65	29.17	211	35.179	208	71.10	116	19.187	210	67.04	177
30.6	30.775	244	26.97	174	21.37	48	31.28	249	35.387	163	69.94	89	19.397	166	68.81	153
Feb. 9.6	31.019	164	28.71	205	21.85	31	33.77	276	35.550	113	69.05	61	19.563	118	70.34	130
19.5	31.183	78	30.76	226	22.16	10	36.53	293	35.663	66	68.44	35	19.681	70	71.64	103
Mar. 1.5	31.261	— 4	33.02	237	22.26	— 5	39.46	297	35.729	19	68.09	9	19.751	27	72.67	78
11.5	31.257	79	35.39	237	22.21	24	42.43	288	35.748	— 22	68.00	— 11	19.778	— 14	73.45	55
21.4	31.178	146	37.76	228	21.97	40	45.31	269	35.726	55	68.11	29	19.764	47	74.00	30
31.4	31.032	201	40.04	208	21.57	53	48.00	237	35.671	85	68.40	42	19.717	76	74.30	13
Apr. 10.4	30.831	243	42.12	182	21.04	64	50.37	198	35.586	104	68.82	51	19.641	95	74.42	— 5
20.4	30.588	272	43.94	147	20.40	71	52.35	153	35.482	120	69.33	58	19.546	110	74.37	23
30.3	30.316	288	45.41	109	19.69	76	53.88	102	35.362	124	69.91	61	19.436	118	74.14	35
May 10.3	30.028	292	46.50	68	18.93	79	54.90	47	35.238	125	70.52	61	19.318	119	73.79	46
20.3	29.736	286	47.18	24	18.14	78	55.37	— 7	35.113	119	71.13	60	19.199	116	73.33	55
30.3	29.450	269	47.42	— 20	17.36	75	55.30	61	34.994	112	71.73	57	19.083	111	72.78	63
June 9.2	29.181	243	47.22	63	16.61	70	54.69	113	34.882	100	72.30	52	18.972	101	72.15	69
19.2	28.938	213	46.59	104	15.91	63	53.56	162	34.782	84	72.82	46	18.871	88	71.46	72
29.2	28.725	175	45.55	142	15.28	54	51.94	207	34.698	67	73.28	39	18.783	73	70.74	74
July 9.1	28.550	135	44.13	177	14.74	42	49.87	246	34.631	49	73.67	30	18.710	56	70.00	73
19.1	28.415	90	42.36	209	14.32	33	47.41	279	34.582	26	73.97	18	18.654	37	69.27	69
29.1	28.325	44	40.27	236	13.99	21	44.62	309	34.556	5	74.15	6	18.617	15	68.58	63
Aug. 8.1	28.281	— 6	37.91	259	13.78	8	41.53	329	34.551	— 20	74.21	— 8	18.602	— 8	67.95	53
18.0	28.287	57	35.32	276	13.70	— 5	38.24	344	34.571	47	74.13	25	18.610	36	67.42	40
28.0	28.344	110	32.56	290	13.75	17	34.80	354	34.618	76	73.88	42	18.646	65	67.02	21
Sept. 7.0	28.454	163	29.66	297	13.92	29	31.26	354	34.694	107	73.46	64	18.711	95	66.81	1
17.0	28.617	219	26.69	300	14.21	44	27.72	346	34.801	139	72.82	85	18.806	128	66.80	— 24
26.9	28.836	274	23.69	298	14.65	55	24.26	334	34.940	174	71.97	108	18.934	164	67.04	50
Oct. 6.9	29.110	328	20.71	287	15.20	67	20.92	313	35.114	208	70.89	130	19.098	199	67.54	79
16.9	29.438	379	17.84	272	15.87	78	17.79	285	35.322	240	69.59	151	19.297	232	68.33	109
26.8	29.817	425	15.12	250	16.65	89	14.94	250	35.562	271	68.08	170	19.529	265	69.42	136
Nov. 5.8	30.242	464	12.62	219	17.54	95	12.44	207	35.833	297	66.38	185	19.794	290	70.78	163
15.8	30.706	493	10.43	184	18.49	102	10.37	158	36.130	315	64.53	196	20.084	311	72.41	185
25.8	31.199	510	8.59	141	19.51	104	8.79	103	36.445	327	62.57	200	20.395	323	74.26	200
Dec. 5.7	31.709	512	7.18	95	20.55	106	7.76	44	36.772	328	60.57	198	20.718	324	76.26	213
15.7	32.221	499	6.23	42	21.61	102	7.32	— 15	37.100	320	58.59	189	21.042	317	78.39	215
25.7	32.720	467	5.81	— 8	22.63	95	7.47	74	37.420	299	56.70	175	21.359	297	80.54	210
35.7	33.187		5.89		23.58		8.21		37.719		54.95		21.656		82.64	
Mean Place	27.290		46.95		15.102		51.11		32.882		85.99		16.940		54.52	
Sec δ, Tan δ	1.807		+1.504		4.170		+4.049		1.015		+0.171		1.000		−0.023	
$D_\psi \alpha$, $D_\omega \alpha$	+0.08		+0.09		+0.10		+0.25		+0.06		+0.01		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**41 Leonis Minoris.** Mag. 5.0				**θ Argus.** Mag. 3.0				**42 Leonis Minoris.** Mag. 5.4				**η Argus.** Var. 1.6–6.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	10 39		+23 36		10 40		−63 58		10 41		+31 5		10 41		−59 15	
	s		″		s		″		s		″		s		″	
Jan. 0.7	2.647		30.44		6.41		5.48		23.661		75.59		57.290		23.15	
		309		112		48		304		328		83		434		305
10.6	2.956		29.32		6.89		8.52		23.989		74.76		57.724		26.20	
		275		79		41		339		292		44		370		337
20.6	3.231		28.53		7.30		11.91		24.281		74.32		58.094		29.57	
		232		43		33		364		247		5		300		360
30.6	3.463		28.10		7.63		15.55		24.528		74.27	—	58.394		33.17	
		184		11		25		378		196		33		223		373
Feb. 9.6	3.647		27.99	—	7.88		19.33		24.724		74.60		58.617		36.90	
		133		23		14		383		140		67		144		375
19.5	3.780		28.22		8.02		23.16		24.864		75.27		58.761		40.65	
		80		50		6		380		86		94		66		370
Mar. 1.5	3.860		28.72		8.08	—	26.96		24.950		76.21		58.827	—	44.35	
		30		74		2		368		32		118		9		355
11.5	3.890	—	29.46		8.06		30.64		24.982	—	77.39		58.818		47.90	
		15		91		11		345		17		131		76		334
21.4	3.875		30.37		7.95		34.09		24.965		78.70		58.742		51.24	
		55		102		17		317		59		140		138		306
31.4	3.820		31.39		7.78		37.26		24.906		80.10		58.604		54.30	
		87		108		23		285		94		140		190		271
Apr. 10.4	3.733		32.47		7.55		40.11		24.812		81.50		58.414		57.01	
		110		108		29		246		123		134		232		234
20.4	3.623		33.55		7.26		42.57		24.689		82.84		58.182		59.35	
		128		102		32		202		139		121		268		190
30.3	3.495		34.57		6.94		44.59		24.550		84.05		57.914		61.25	
		136		93		36		155		151		107		291		143
May 10.3	3.359		35.50		6.58		46.14		24.399		85.12		57.623		62.68	
		140		80		38		105		155		86		309		96
20.3	3.219		36.30		6.20		47.19		24.244		85.98		57.314		63.64	
		135		63		38		53		151		64		317		44
30.3	3.084		36.93		5.82		47.72		24.093		86.62		56.997		64.08	—
		128		48		39		0		144		40		317		6
June 9.2	2.956		37.41		5.43		47.72		23.949		87.02		56.680		64.02	
		115		28		38		50		131		14		307		54
19.2	2.841		37.69		5.05		47.22		23.818		87.16	—	56.373		63.48	
		101		10		35		100		114		11		292		104
29.2	2.740		37.79	—	4.70		46.22		23.704		87.05		56.081		62.44	
		84		9		32		148		95		36		267		148
July 9.1	2.656		37.70		4.38		44.74		23.609		86.69		55.814		60.96	
		62		29		29		190		73		61		235		189
19.1	2.594		37.41		4.09		42.84		23.536		86.08		55.579		59.07	
		41		49		24		228		52		84		193		225
29.1	2.553		36.92		3.85		40.56		23.484		85.24		55.386		56.82	
		16		68		19		259		23		108		146		253
Aug. 8.1	2.537	—	36.24		3.66		37.97		23.461	—	84.16		55.240		54.29	
		10		87		11		279		4		129		88		273
18.0	2.547		35.37		3.55		35.18		23.465		82.87		55.152		51.56	
		37		108		4		291		36		150		27		283
28.0	2.584		34.29		3.51	—	32.27		23.501		81.37		55.125	—	48.73	
		69		126		4		294		68		170		42		283
Sept. 7.0	2.653		33.03		3.55		29.33		23.569		79.67		55.167		45.90	
		101		145		13		285		103		186		113		274
17.0	2.754		31.58		3.68		26.48		23.672		77.81		55.280		43.16	
		135		163		21		263		140		202		187		251
26.9	2.889		29.95		3.89		23.85		23.812		75.79		55.467		40.65	
		173		179		30		233		178		216		261		220
Oct. 6.9	3.062		28.16		4.19		21.52		23.990		73.63		55.728		38.45	
		209		193		38		190		217		224		333		178
16.9	3.271		26.23		4.57		19.62		24.207		71.39		56.061		36.67	
		245		204		46		139		255		229		397		129
26.8	3.516		24.19		5.03		18.23		24.462		69.10		56.458		35.38	
		277		212		51		84		291		230		452		72
Nov. 5.8	3.793		22.07		5.54		17.39		24.753		66.80		56.910		34.66	
		307		212		56		21		321		224		495		10
15.8	4.100		19.95		6.10		17.18	—	25.074		64.56		57.405		34.56	—
		329		207		60		44		345		212		522		54
25.8	4.429		17.88		6.70		17.62		25.419		62.44		57.927		35.10	
		343		199		60		108		361		195		533		116
Dec. 5.7	4.772		15.89		7.30		18.70		25.780		60.49		58.460		36.26	
		348		181		59		169		366		168		527		175
15.7	5.120		14.08		7.89		20.39		26.146		58.81		58.987		38.01	
		342		157		57		225		360		140		502		230
25.7	5.462		12.51		8.46		22.64		26.506		57.41		59.489		40.31	
		324		131		51		275		342		104		464		277
35.7	5.786		11.20		8.97		25.39		26.848		56.37		59.953		43.08	
Mean Place	0.909		46.33		3.754		13.43		21.897		93.50		54.877		30.38	
Sec δ, Tan δ	1.091		+0.437		2.279		−2.048		1.168		+0.603		1.956		−1.682	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.07		+0.03		+0.04		−0.13		+0.07		+0.04		+0.05		−0.11	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.4		+0.3		−0.4		+0.3		−0.4		+0.3		−0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Argus. Mag. 2.8				l Leonis. Mag. 5.3				δ² Chamæleontis. Mag. 4.6				ν Hydræ. Mag. 3.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 10 43		° ′ −48 59		h m 10 45		° ′ +10 57		h m 10 44		° ′ −80 6		h m 10 45		° ′ −15 46	
	s		″		s		″		s		″		s		″	
Jan. 0.7	18.998	365	26.77	304	1.769	296	74.37	165	67.33	108	36.52	277	39.318	293	13.13	251
10.6	19.363	316	29.81	329	2.065	263	72.72	142	68.41	91	39.29	321	39.611	258	15.64	250
20.6	19.679	259	33.10	345	2.328	223	71.30	114	69.32	71	42.50	355	39.869	218	18.14	243
30.6	19.938	197	36.55	355	2.551	179	70.16	86	70.03	51	46.05	376	40.087	173	20.57	230
Feb. 9.6	20.135	133	40.10	351	2.730	130	69.30	55	70.54	29	49.81	391	40.260	124	22.87	210
19.5	20.268	70	43.61	342	2.860	82	68.75	28	70.83	8	53.72	394	40.384	77	24.97	190
Mar. 1.5	20.338	10	47.03	324	2.942	36	68.47	3	70.91	12	57.66	389	40.461	32	26.87	164
11.5	20.348	44	50.27	300	2.978	5	68.44	20	70.79	32	61.55	373	40.493	8	28.51	138
21.5	20.304	93	53.27	271	2.973	42	68.64	37	70.47	50	65.28	354	40.485	43	29.89	110
31.4	20.211	133	55.98	238	2.931	71	69.01	50	69.97	66	68.82	323	40.442	72	30.99	86
Apr. 10.4	20.078	167	58.36	199	2.860	93	69.51	60	69.31	80	72.05	287	40.370	93	31.85	58
20.4	19.911	191	60.35	158	2.767	110	70.11	66	68.51	92	74.92	247	40.277	110	32.43	32
30.3	19.720	210	61.93	115	2.657	119	70.77	68	67.59	100	77.39	199	40.167	120	32.75	9
May 10.3	19.510	220	63.08	70	2.538	122	71.45	67	66.59	108	79.38	149	40.047	123	32.84	16
20.3	19.290	225	63.78	24	2.416	118	72.12	64	65.51	113	80.87	98	39.924	124	32.68	37
30.3	19.065	224	64.02	22	2.298	114	72.76	60	64.38	114	81.85	41	39.800	118	32.31	59
June 9.2	18.841	215	63.80	67	2.184	104	73.36	53	63.24	112	82.26	15	39.682	111	31.72	78
19.2	18.626	204	63.13	110	2.080	93	73.89	45	62.12	109	82.11	67	39.571	101	30.94	94
29.2	18.422	184	62.03	149	1.987	76	74.34	36	61.03	102	81.44	120	39.470	88	30.00	109
July 9.2	18.238	159	60.54	184	1.911	60	74.70	25	60.01	91	80.24	171	39.382	70	28.91	121
19.1	18.079	129	58.70	214	1.851	41	74.95	13	59.10	77	78.53	214	39.312	52	27.70	127
29.1	17.950	94	56.56	236	1.810	19	75.08	0	58.33	63	76.39	251	39.260	29	26.43	130
Aug. 8.1	17.856	52	54.20	252	1.791	4	75.08	17	57.70	44	73.88	281	39.231	6	25.13	127
18.0	17.804	6	51.68	258	1.795	31	74.91	33	57.26	23	71.07	301	39.225	22	23.86	118
28.0	17.798	46	49.10	254	1.826	60	74.58	51	57.03	2	68.06	310	39.247	53	22.68	106
Sept. 7.0	17.844	100	46.56	242	1.886	89	74.07	73	57.01	21	64.96	307	39.300	87	21.62	86
17.0	17.944	157	44.14	217	1.975	125	73.34	94	57.22	43	61.89	293	39.387	124	20.76	59
26.9	18.101	215	41.97	186	2.100	159	72.40	117	57.65	67	58.96	268	39.511	161	20.17	30
Oct. 6.9	18.316	269	40.11	143	2.259	195	71.23	138	58.32	86	56.28	232	39.672	199	19.87	4
16.9	18.585	322	38.68	93	2.454	228	69.85	160	59.18	105	53.96	185	39.871	234	19.91	44
26.9	18.907	367	37.75	39	2.682	263	68.25	177	60.23	120	52.11	128	40.105	269	20.35	82
Nov. 5.8	19.274	403	37.36	19	2.945	290	66.48	191	61.43	131	50.83	69	40.374	297	21.17	120
15.8	19.677	427	37.55	79	3.235	313	64.57	201	62.74	138	50.14	2	40.671	318	22.37	157
25.8	20.104	437	38.34	136	3.548	326	62.56	205	64.12	138	50.12	61	40.989	331	23.94	187
Dec. 5.7	20.541	435	39.70	192	3.874	331	60.51	201	65.50	137	50.73	130	41.320	333	25.81	215
15.7	20.976	418	41.62	239	4.205	325	58.50	192	66.87	129	52.03	190	41.653	325	27.96	233
25.7	21.394	386	44.01	279	4.530	308	56.58	176	68.16	115	53.93	246	41.978	306	30.29	245
35.7	21.780		46.80		4.838		54.82		69.31		56.39		42.284		32.74	
Mean Place	16.907		31.96		0.099		86.64		62.198		46.61		37.607		9.24	
Sec δ, Tan δ	1.524		−1.150		1.019		+0.194		5.825		−5.739		1.039		−0.282	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.05		−0.07		+0.06		+0.01		+0.01		−0.36		+0.06		−0.02	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.4		+0.3		−0.4		+0.3		−0.4		+0.3		−0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	46 Leonis Minoris. Mag. 3.9				54 Leonis. Mag. 4.5				ι Antliæ. Mag. 4.7				Groombridge 1706. Mag. 6.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	10 48		+34 38		10 51		+25 10		10 52		−36 42		10 53		+78 11	
	s		″		s		″		s		″		s		″	
Jan. 0.7	48.930	342	48.04	75	15.485	321	39.11	114	58.538	330	5.11	286	34.50	110	50.40	80
10.6	49.272	306	47.29	32	15.806	286	37.97	77	58.868	290	7.97	307	35.60	98	51.20	142
20.6	49.578	263	46.97	— 8	16.092	245	37.20	42	59.158	243	11.04	314	36.58	84	52.62	194
30.6	49.841	209	47.05	49	16.337	197	36.78	5	59.401	193	14.18	316	37.42	64	54.56	236
Feb. 9.6	50.050	154	47.54	84	16.534	146	36.73	— 29	59.594	138	17.34	308	38.06	46	56.92	271
19.5	50.204	97	48.38	113	16.680	94	37.02	59	59.732	84	20.42	295	38.52	23	59.63	294
Mar. 1.5	50.301	41	49.51	136	16.774	43	37.61	83	59.816	34	23.37	276	38.75	4	62.57	303
11.5	50.342	— 11	50.87	150	16.817	— 4	38.44	101	59.850	— 13	26.13	250	38.79	— 19	65.60	300
21.5	50.331	56	52.37	157	16.813	43	39.45	113	59.837	53	28.63	222	38.60	36	68.60	286
31.4	50.275	93	53.94	157	16.770	78	40.58	120	59.784	87	30.85	191	38.24	54	71.46	260
Apr. 10.4	50.182	124	55.51	149	16.692	104	41.78	118	59.697	116	32.76	156	37.70	69	74.06	224
20.4	50.058	144	57.00	135	16.588	123	42.96	113	59.581	136	34.32	120	37.01	80	76.30	181
30.3	49.914	157	58.35	116	16.465	134	44.09	102	59.445	152	35.52	82	36.21	87	78.11	131
May 10.3	49.757	162	59.51	93	16.331	138	45.11	89	59.293	160	36.34	45	35.34	92	79.42	79
20.3	49.595	162	60.44	67	16.193	138	46.00	70	59.133	164	36.79	6	34.42	94	80.21	23
30.3	49.433	154	61.11	40	16.055	132	46.70	53	58.969	161	36.85	— 31	33.48	92	80.44	— 32
June 9.2	49.279	142	61.51	11	15.923	121	47.23	31	58.808	157	36.54	69	32.56	88	80.12	87
19.2	49.137	126	61.62	— 17	15.802	109	47.54	12	58.651	148	35.85	103	31.68	82	79.25	139
29.2	49.011	107	61.45	46	15.693	92	47.66	— 10	58.503	133	34.82	133	30.86	73	77.86	187
July 9.2	48.904	85	60.99	74	15.601	73	47.56	33	58.370	115	33.49	162	30.13	62	75.99	231
19.1	48.819	61	60.25	99	15.528	53	47.23	52	58.255	94	31.87	185	29.51	51	73.68	269
29.1	48.758	34	59.26	125	15.475	29	46.71	76	58.161	65	30.02	201	29.00	37	70.99	301
Aug. 8.1	48.724	6	58.01	148	15.446	4	45.95	95	58.096	36	28.01	212	28.63	23	67.98	327
18.0	48.718	— 27	56.53	170	15.442	— 25	45.00	116	58.060	1	25.89	213	28.40	10	64.71	347
28.0	48.745	60	54.83	189	15.467	55	43.84	136	58.059	— 39	23.76	206	28.30	— 6	61.24	359
Sept. 7.0	48.805	95	52.94	208	15.522	88	42.48	157	58.098	82	21.70	193	28.36	20	57.65	365
17.0	48.900	135	50.86	222	15.610	123	40.91	173	58.180	129	19.77	169	28.56	37	54.00	363
26.9	49.035	175	48.64	234	15.733	161	39.18	190	58.309	175	18.08	137	28.93	52	50.37	352
Oct. 6.9	49.210	215	46.30	241	15.894	199	37.28	204	58.484	222	16.71	96	29.45	67	46.85	336
16.9	49.425	256	43.89	245	16.093	236	35.24	215	58.706	265	15.75	53	30.12	79	43.49	310
26.9	49.681	293	41.44	242	16.329	272	33.09	221	58.971	306	15.22	1	30.91	93	40.39	277
Nov. 5.8	49.974	325	39.02	234	16.601	303	30.88	221	59.277	340	15.21	— 50	31.84	103	37.62	237
15.8	50.299	353	36.68	219	16.904	328	28.67	217	59.617	363	15.71	101	32.87	113	35.25	189
25.8	50.652	370	34.49	198	17.232	344	26.50	203	59.980	378	16.72	152	34.00	118	33.36	134
Dec. 5.7	51.022	377	32.51	169	17.576	351	24.47	187	60.358	378	18.24	198	35.18	120	32.02	76
15.7	51.399	372	30.82	137	17.927	347	22.60	162	60.736	369	20.22	236	36.38	119	31.26	15
25.7	51.771	355	29.45	97	18.274	333	20.98	132	61.105	345	22.58	270	37.57	115	31.11	— 47
35.7	52.126		28.48		18.607		19.66		61.450		25.28		38.72		31.58	
Mean Place	47.199		66.97		13.823		55.59		56.700		7.54		31.007		76.06	
Sec δ, Tan δ	1.215		+0.691		1.105		+0.470		1.247		−0.746		4.890		+4.786	
$D_\psi a$, $D_\omega a$	+0.07		+0.04		+0.07		+0.03		+0.06		−0.05		+0.10		+0.31	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.3		−0.4		+0.3		−0.4		+0.3		−0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Crateris. Mag. 4.2				d Leonis. Mag. 5.0				β Ursæ Majoris. Mag. 2.4				α Ursæ Majoris. Mag. 2.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	10 55		−17 52		10 56		+ 4 2		10 56		+56 48		10 58		+62 10	
	s		″		s		″		s		″		s		″	
Jan. 0.7	51.251		5.63		24.284		59.39		59.813		37.16		46.64		54.41	
		299		253		296		193		473		6		54		23
10.7	51.550		8.16		24.580		57.46		60.286		37.22		47.18		54.64	
		266		256		267		175		427		60		49		80
20.6	51.816		10.72		24.847		55.71		60.713		37.82		47.67		55.44	
		226		251		228		152		366		111		42		132
30.6	52.042		13.23		25.075		54.19		61.079		38.93		48.09		56.76	
		181		239		186		126		295		157		34		178
Feb. 9.6	52.223		15.62		25.261		52.93		61.374		40.50		48.43		58.54	
		136		223		139		100		216		193		23		216
19.5	52.359		17.85		25.400		51.93		61.590		42.43		48.66		60.70	
		87		200		92		72		133		224		15		243
Mar. 1.5	52.446		19.85		25.492		51.21		61.723		44.67		48.81		63.13	
		41		178		47		46		50		241		6		262
11.5	52.487		21.63		25.539		50.75		61.773	—	47.08		48.87	—	65.75	
		2		152		5		22		27		249		4		266
21.5	52.489	—	23.15		25.544	—	50.53		61.746		49.57		48.83		68.41	
		35		124		30		1		100		246		12		260
31.4	52.454		24.39		25.514		50.52	—	61.646		52.03		48.71		71.01	
		65		98		59		18		160		232		21		245
Apr. 10.4	52.389		25.37		25.455		50.70		61.486		54.35		48.50		73.46	
		88		71		82		32		210		210		25		219
20.4	52.301		26.08		25.373		51.02		61.276		56.45		48.25		75.65	
		105		45		99		43		248		179		30		186
30.4	52.196		26.53		25.274		51.45		61.028		58.24		47.95		77.51	
		117		18		109		51		273		145		33		146
May 10.3	52.079		26.71	—	25.165		51.96		60.755		59.69		47.62		78.97	
		123		5		114		57		286		103		36		102
20.3	51.956		26.66		25.051		52.53		60.469		60.72		47.26		79.99	
		124		31		115		61		290		60		35		55
30.3	51.832		26.35		24.936		53.14		60.179		61.32		46.91		80.54	
		122		52		110		63		283		14		35		7
June 9.2	51.710		25.83		24.826		53.77		59.896		61.46	—	46.56		80.61	—
		115		74		104		63		266		30		34		41
19.2	51.595		25.09		24.722		54.40		59.630		61.16		46.22		80.20	
		107		93		94		61		245		75		30		89
29.2	51.488		24.16		24.628		55.01		59.385		60.41		45.92		79.31	
		95		108		81		58		215		116		27		132
July 9.2	51.393		23.08		24.547		55.59		59.170		59.25		45.65		77.99	
		81		123		65		52		180		156		23		175
19.1	51.312		21.85		24.482		56.11		58.990		57.69		45.42		76.24	
		61		130		49		45		142		191		18		212
29.1	51.251		20.55		24.433		56.56		58.848		55.78		45.24		74.12	
		42		135		29		34		99		225		14		245
Aug. 8.1	51.209		19.20		24.404		56.90		58.749		53.53		45.10		71.67	
		17		134		7		22		52		253		8		273
18.1	51.192	—	17.86		24.397	—	57.12		58.697		51.00		45.02		68.94	
		11		129		19		7		3		275		2		297
28.0	51.203		16.57		24.416		57.19	—	58.694	—	48.25		45.00	—	65.97	
		41		115		46		11		50		293		5		314
Sept. 7.0	51.244		15.42		24.462		57.08		58.744		45.32		45.05		62.83	
		76		97		78		32		105		308		11		326
17.0	51.320		14.45		24.540		56.76		58.849		42.24		45.16		59.57	
		113		72		111		55		161		315		18		332
26.9	51.433		13.73		24.651		56.21		59.010		39.09		45.34		56.25	
		151		43		147		80		220		317		24		332
Oct. 6.9	51.584		13.30		24.798		55.41		59.230		35.92		45.58		52.93	
		190		8		182		106		280		311		31		323
16.9	51.774		13.22	—	24.980		54.35		59.510		32.81		45.89		49.70	
		229		30		219		130		336		299		38		308
26.9	52.003		13.52		25.199		53.05		59.846		29.82		46.27		46.62	
		264		70		253		156		389		281		44		286
Nov. 5.8	52.267		14.22		25.452		51.49		60.235		27.01		46.71		43.76	
		295		110		282		175		437		254		49		255
15.8	52.562		15.32		25.734		49.74		60.672		24.47		47.20		41.21	
		317		148		307		193		475		219		54		217
25.8	52.879		16.80		26.041		47.81		61.147		22.28		47.74		39.04	
		331		180		321		204		502		179		57		173
Dec. 5.8	53.210		18.60		26.362		45.77		61.649		20.49		48.31		37.31	
		337		211		327		210		515		132		58		122
15.7	53.547		20.71		26.689		43.67		62.164		19.17		48.89		36.09	
		330		231		324		208		513		80		59		68
25.7	53.877		23.02		27.013		41.59		62.677		18.37		49.48		35.41	
		311		246		308		199		491		26		56		10
35.7	54.188		25.48		27.321		39.60		63.168		18.11		50.04		35.31	
Mean Place	49.578		2.57		22.678		69.49		57.873		60.82		44.585		78.89	
Sec δ, Tan δ	1.051		−0.322		1.002		+0.070		1.827		+1.529		2.143		+1.895	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		−0.02		+0.06		0.00		+0.07		+0.10		+0.07		+0.12	
$D_\psi\delta$, $D_\omega\delta$	−0.4		+0.3		−0.4		+0.3		−0.4		+0.3		−0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Leonis. Mag. 4.7				p¹ Leonis. Mag. 5.7				ψ Ursæ Majoris. Mag. 3.2				β Crateris. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 11 0		° ′ + 7 45		h m 11 2		° ′ + 2 23		h m 11 5		° ′ +44 55		h m 11 7		° ′ −22 23	
	s		″		s		″		s		″		s		″	
Jan. 0.7	51.975		76.26		47.940		34.72		8.679		56.18		41.960		2.07	
10.7	52.275	300	74.44	182	48.239	299	32.73	199	9.069	390	55.69	49	42.272	312	4.67	260
20.6	52.547	272	72.85	159	48.508	269	30.90	183	9.425	356	55.72	3	42.553	281	7.33	266
30.6	52.780	233	71.49	136	48.741	233	29.29	161	9.733	308	56.23	51	42.793	240	9.98	265
Feb. 9.6	52.970	190	70.43	106	48.930	189	27.91	138	9.986	253	57.17	94	42.989	196	12.56	258
19.5	53.114	144	69.66	77	49.073	143	26.81	110	10.175	189	58.51	134	43.138	149	15.00	244
Mar. 1.5	53.210	96	69.15	51	49.170	97	25.98	83	10.301	126	60.17	166	43.239	101	17.27	227
11.5	53.261	51	68.93	22	49.223	53	25.42	56	10.362	61	62.06	189	43.295	56	19.30	203
21.5	53.271	10	68.93	0	49.235	12	25.11	31	10.362	0	64.09	203	43.308	13	21.10	180
31.4	53.244	27	69.14	21	49.210	25	25.00	11	10.308	54	66.17	208	43.284	24	22.62	152
Apr. 10.4	53.187	57	69.51	37	49.157	53	25.08	8	10.207	101	68.20	203	43.230	54	23.86	124
20.4	53.106	81	70.00	49	49.078	79	25.34	26	10.068	139	70.10	190	43.149	81	24.83	97
30.4	53.008	98	70.57	57	48.984	94	25.71	37	9.900	168	71.80	170	43.050	99	25.51	68
May 10.3	52.899	109	71.20	63	48.878	106	26.18	47	9.712	188	73.23	143	42.937	113	25.91	40
20.3	52.785	114	71.86	66	48.766	112	26.72	54	9.514	198	74.35	112	42.815	122	26.02	11
30.3	52.669	116	72.52	66	48.652	114	27.32	60	9.313	201	75.13	78	42.689	126	25.86	16
June 9.2	52.556	113	73.15	63	48.542	110	27.95	63	9.115	198	75.56	43	42.564	125	25.45	41
19.2	52.450	106	73.75	60	48.437	105	28.59	64	8.928	187	75.60	4	42.441	123	24.78	67
29.2	52.354	96	74.30	55	48.341	96	29.23	64	8.757	171	75.26	34	42.327	114	23.89	89
July 9.2	52.269	85	74.77	47	48.256	85	29.85	62	8.604	153	74.56	70	42.221	106	22.79	110
19.1	52.200	69	75.16	39	48.186	70	30.42	57	8.477	127	73.52	104	42.129	92	21.52	127
29.1	52.147	53	75.43	27	48.132	54	30.93	51	8.374	103	72.15	137	42.053	76	20.13	139
Aug. 8.1	52.114	33	75.60	17	48.096	36	31.35	42	8.303	71	70.46	169	41.998	55	18.66	147
18.1	52.103	11	75.61	1	48.083	13	31.66	31	8.265	38	68.51	195	41.968	30	17.16	150
28.0	52.117	14	75.45	16	48.095	12	31.81	15	8.263	2	66.30	221	41.964	4	15.69	147
Sept. 7.0	52.158	41	75.12	33	48.134	39	31.80	1	8.300	37	63.89	241	41.993	29	14.31	138
17.0	52.232	74	74.58	54	48.204	70	31.57	23	8.379	79	61.29	260	42.058	65	13.10	121
26.9	52.339	107	73.80	78	48.308	104	31.13	44	8.503	124	58.57	272	42.162	104	12.12	98
Oct. 6.9	52.480	141	72.80	100	48.447	139	30.42	71	8.674	171	55.76	281	42.306	144	11.43	69
16.9	52.659	179	71.55	125	48.624	177	29.45	97	8.892	218	52.91	285	42.491	185	11.10	33
26.9	52.875	216	70.07	148	48.838	214	28.21	124	9.158	266	50.09	282	42.717	226	11.15	5
Nov. 5.8	53.126	251	68.38	169	49.086	248	26.72	149	9.468	310	47.36	273	42.981	264	11.61	46
15.8	53.406	280	66.52	186	49.364	278	25.00	172	9.819	351	44.80	256	43.278	297	12.50	89
25.8	53.711	305	64.52	200	49.667	303	23.10	190	10.202	383	42.46	234	43.600	322	13.80	130
Dec. 5.8	54.033	322	62.45	207	49.986	319	21.06	204	10.610	408	40.43	203	43.938	338	15.48	168
15.7	54.361	328	60.37	208	50.313	327	18.94	212	11.029	419	38.78	165	44.283	345	17.50	202
25.7	54.686	325	58.34	203	50.636	323	16.84	210	11.449	420	37.56	122	44.623	340	19.78	228
35.7	54.997	311	56.44	190	50.945	309	14.79	205	11.853	404	36.80	76	44.947	324	22.26	248
Mean Place	50.397		87.54		46.368		44.26		7.006		77.80		40.321		0.66	
Sec δ, Tan δ	1.009		+0.136		1.001		+0.042		1.412		+0.997		1.082		−0.412	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		+0.01		+0.06		0.00		+0.07		+0.06		+0.06		−0.03	
$D_\psi\delta$, $D_\omega\delta$	−0.4		+0.3		−0.4		+0.2		−0.4		+0.2		−0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Leonis. Mag. 2.6				θ Leonis. Mag. 3.4				ν Ursæ Majoris. Mag. 3.7				δ Crateris. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	11 9		+20 57		11 9		+15 51		11 14		+33 31		11 15		−14 20	
	s		″		s		″		s		″		s		″	
Jan. 0.7	49.740		48.19		60.983		67.17		8.016		52.52		18.928		28.01	
10.7	50.061	321	46.78	141	61.295	312	65.59	158	8.366	350	51.53	99	19.236	308	30.41	240
20.6	50.352	291	45.71	107	61.580	285	64.30	129	8.685	319	50.99	54	19.515	279	32.82	241
30.6	50.606	254	44.99	72	61.827	247	63.32	98	8.966	281	50.88	11 —	19.758	243	35.15	233
Feb. 9.6	50.815	209	44.64	35	62.031	204	62.69	63	9.197	231	51.19	31	19.957	199	37.36	221
19.6	50.976	161	44.62	2 —	62.189	158	62.38	31	9.377	180	51.89	70	20.112	155	39.38	202
Mar. 1.5	51.088	112	44.92	30	62.298	109	62.36	2 —	9.501	124	52.91	102	20.221	109	41.20	182
11.5	51.151	63	45.49	57	62.360	62	62.63	27	9.572	71	54.22	131	20.285	64	42.77	157
21.5	51.169	18 —	46.29	80	62.379	19 —	63.12	49	9.590	18 —	55.71	149	20.308	23 —	44.11	134
31.4	51.147	22	47.23	94	62.359	20	63.80	68	9.563	27	57.31	160	20.295	13	45.17	106
Apr. 10.4	51.092	55	48.28	105	62.307	52	64.60	80	9.496	67	58.95	164	20.253	42	46.00	83
20.4	51.008	84	49.37	109	62.228	79	65.47	87	9.397	99	60.56	161	20.184	69	46.57	57
30.4	50.905	103	50.45	108	62.131	97	66.37	90	9.272	125	62.06	150	20.097	87	46.90	33
May 10.3	50.787	118	51.47	102	62.020	111	67.26	89	9.132	140	63.39	133	19.996	101	47.01	11 —
20.3	50.663	124	52.40	93	61.901	119	68.10	84	8.981	151	64.51	112	19.886	110	46.91	10
30.3	50.536	127	53.20	80	61.781	120	68.86	76	8.827	154	65.40	89	19.772	114	46.60	31
June 9.3	50.411	125	53.84	64	61.663	118	69.51	65	8.675	152	66.01	61	19.657	115	46.11	49
19.2	50.294	117	54.32	48	61.551	112	70.06	55	8.529	146	66.33	32	19.545	112	45.43	68
29.2	50.184	110	54.61	29	61.447	104	70.46	40	8.393	136	66.37	4 —	19.439	106	44.61	82
July 9.2	50.088	96	54.72	11 —	61.355	92	70.71	25	8.273	120	66.11	26	19.341	98	43.66	95
19.1	50.006	82	54.64	8	61.277	78	70.82	11 —	8.169	104	65.57	54	19.255	86	42.61	105
29.1	49.943	63	54.34	30	61.216	61	70.76	6	8.085	84	64.74	83	19.185	70	41.49	112
Aug. 8.1	49.898	45	53.84	50	61.174	42	70.51	25	8.025	60	63.63	111	19.131	54	40.34	115
18.1	49.878	20 —	53.13	71	61.155	19 —	70.09	42	7.992	33	62.27	136	19.100	31	39.21	113
28.0	49.883	5	52.22	91	61.160	5	69.46	63	7.986	6 —	60.66	161	19.095	5 —	38.14	107
Sept. 7.0	49.918	35	51.09	113	61.194	34	68.64	82	8.014	28	58.84	182	19.119	24	37.19	95
17.0	49.984	66	49.75	134	61.259	65	67.60	104	8.078	64	56.80	204	19.176	57	36.42	77
27.0	50.086	102	48.21	154	61.359	100	66.35	125	8.180	102	54.60	220	19.268	92	35.88	54
Oct. 6.9	50.224	138	46.48	173	61.494	135	64.89	146	8.322	142	52.24	236	19.400	132	35.62	26 —
16.9	50.401	177	44.57	191	61.668	174	63.22	167	8.507	185	49.77	247	19.573	173	35.67	5
26.9	50.618	217	42.51	206	61.880	212	61.38	184	8.734	227	47.24	253	19.784	211	36.08	41
Nov. 5.8	50.871	253	40.35	216	62.128	248	59.39	199	9.002	268	44.70	254	20.033	249	36.85	77
15.8	51.157	286	38.13	222	62.408	280	57.29	210	9.308	306	42.21	249	20.314	281	37.99	114
25.8	51.471	314	35.91	222	62.716	308	55.14	215	9.643	335	39.84	237	20.622	308	39.48	149
Dec. 5.8	51.804	333	33.76	215	63.041	325	53.00	214	10.002	359	37.67	217	20.948	326	41.26	178
15.7	52.147	343	31.74	202	63.377	336	50.95	205	10.373	371	35.76	191	21.282	334	43.30	204
25.7	52.490	343	29.91	183	63.712	335	49.03	192	10.745	372	34.16	160	21.613	331	45.52	222
35.7	52.820	330	28.35	156	64.035	323	47.32	171	11.106	361	32.96	120	21.932	319	47.87	235
Mean Place	48.213		63.59		59.460		81.01		6.492		71.51		17.371		24.13	
Sec δ, Tan δ	1.071		+0.383		1.040		+0.284		1.200		+0.663		1.032		−0.256	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.06		+0.02		+0.06		+0.02		+0.06		+0.04		+0.06		−0.02	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.4		+0.2		−0.4		+0.2		−0.4		+0.2		−0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ Leonis. Mag. 4.1				π Centauri. Mag. 4.3				ι Leonis. Mag. 4.0				τ Leonis. Mag. 5.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	11 16		+ 6 27		11 17		−54 2		11 19		+10 57		11 23		+ 3 17	
	s		″		s		″		s		″		s		″	
Jan. 0.7	59.136		73.87		20.463		41.60		43.612		79.76		47.779		59.35	
10.7	59.443	307	71.97	190	20.894	431	44.31	271	43.923	311	77.99	177	48.087	308	57.36	199
20.6	59.724	281	70.29	168	21.280	386	47.39	308	44.208	285	76.47	152	48.371	284	55.53	183
30.6	59.968	244	68.84	145	21.609	329	50.71	332	44.460	252	75.23	124	48.620	249	53.94	159
Feb. 9.6	60.172	204	67.67	117	21.876	267	54.20	349	44.669	209	74.29	94	48.828	208	52.59	135
19.6	60.331	159	66.79	88	22.077	201	57.76	356	44.833	164	73.67	62	48.993	165	51.52	107
Mar. 1.5	60.444	113	66.21	58	22.210	133	61.29	353	44.951	118	73.35	32	49.112	119	50.73	79
11.5	60.512	68	65.89	32	22.278	68	64.73	344	45.023	72	73.30	5 —	49.187	75	50.21	52
21.5	60.538	26 —	65.82	7 —	22.284	6 —	68.00	327	45.052	29 —	73.51	21	49.220	33 —	49.96	25
31.4	60.527	11	65.97	15	22.234	50	71.03	303	45.045	7	73.91	40	49.218	2	49.91	5 —
Apr. 10.4	60.486	41	66.29	32	22.135	99	73.78	275	45.004	41	74.47	56	49.183	35	50.07	16
20.4	60.419	67	66.74	45	21.995	140	76.18	240	44.938	66	75.16	69	49.123	60	50.38	31
30.4	60.333	86	67.30	56	21.817	178	78.21	203	44.851	87	75.90	74	49.043	80	50.82	44
May 10.3	60.234	99	67.93	63	21.612	205	79.82	161	44.750	101	76.68	78	48.949	94	51.35	53
20.3	60.127	107	68.59	66	21.385	227	81.00	118	44.642	108	77.45	77	48.846	103	51.94	59
30.3	60.016	111	69.26	67	21.144	241	81.71	71	44.529	113	78.20	75	48.739	107	52.58	64
June 9.3	59.906	110	69.94	68	20.894	250	81.95	24 —	44.416	113	78.87	67	48.631	108	53.23	65
19.2	59.799	107	70.56	62	20.642	252	81.72	23	44.307	109	79.48	61	48.525	106	53.88	65
29.2	59.699	100	71.15	59	20.395	247	81.02	70	44.205	102	80.00	52	48.427	98	54.52	64
July 9.2	59.609	90	71.67	52	20.159	236	79.88	114	44.113	92	80.41	41	48.333	94	55.12	60
19.1	59.532	77	72.11	44	19.944	215	78.34	154	44.032	81	80.70	29	48.251	82	55.66	54
29.1	59.468	64	72.46	35	19.754	190	76.44	190	43.967	65	80.85	15	48.185	66	56.13	47
Aug. 8.1	59.422	46	72.68	22	19.599	155	74.22	222	43.919	48	80.86	1 —	48.134	51	56.50	37
18.1	59.397	25	72.76	8 —	19.485	114	71.78	244	43.893	26	80.70	16	48.104	30	56.74	24
28.0	59.395	2 —	72.68	8	19.419	66	69.18	260	43.889	4 —	80.36	34	48.095	9 —	56.84	10 —
Sept. 7.0	59.421	26	72.41	27	19.410	9 —	66.54	264	43.913	24	79.83	53	48.115	20	56.77	7
17.0	59.479	58	71.94	47	19.462	52	63.93	261	43.968	55	79.08	75	48.164	49	56.48	29
27.0	59.569	90	71.24	70	19.578	116	61.49	244	44.056	88	78.11	97	48.248	84	55.97	51
Oct. 6.9	59.696	127	70.30	94	19.763	185	59.29	220	44.181	125	76.91	120	48.368	120	55.21	76
16.9	59.861	165	69.11	119	20.013	250	57.43	186	44.345	164	75.49	142	48.527	159	54.20	101
26.9	60.064	203	67.68	143	20.327	314	56.02	141	44.547	202	73.84	165	48.724	197	52.92	128
Nov. 5.8	60.302	238	66.03	165	20.699	372	55.13	89	44.785	238	72.04	180	48.958	234	51.39	153
15.8	60.575	273	64.19	184	21.119	420	54.79	34 —	45.057	272	70.04	200	49.226	268	49.65	174
25.8	60.874	299	62.20	199	21.575	456	55.05	26	45.357	300	67.94	210	49.522	296	47.73	192
Dec. 5.8	61.192	318	60.11	209	22.053	478	55.90	85	45.677	320	65.80	214	49.837	315	45.68	205
15.7	61.520	328	58.00	211	22.537	484	57.34	144	46.008	331	63.70	210	50.164	327	43.55	213
25.7	61.847	327	55.93	207	23.013	476	59.31	197	46.339	331	61.67	203	50.492	328	41.44	211
35.7	62.164	317	53.96	197	23.464	451	61.76	245	46.661	322	59.79	188	50.810	318	39.39	205
Mean Place	57.650		84.68		18.453		49.08		42.148		92.03		46.327		69.05	
Sec δ, Tan δ	1.006		+0.113		1.703		−1.379		1.019		+0.194		1.002		+0.058	
Dψα, Dωα	+0.06		+0.01		+0.05		−0.09		+0.06		+0.01		+0.06		0.00	
Dψδ, Dωδ	−0.4		+0.2		−0.4		+0.2		−0.4		+0.2		−0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Draconis. Mag. 4.1				ξ Hydræ. Mag. 3.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′	
	11 26		+69 45		11 29		−31 24	
	s		″		s		″	
Jan. 0.7	38.61		75.94		2.495		32.00	
10.7	39.32	71	76.08	14	2.835	340	34.59	259
20.6	39.99	67	76.83	75	3.144	309	37.34	275
30.6	40.57	58	78.16	133	3.415	271	40.19	285
Feb. 9.6	41.06	49	80.01	185	3.641	226	43.05	286
19.6	41.44	38	82.29	228	3.819	178	45.86	281
Mar. 1.5	41.68	24	84.90	261	3.948	129	48.54	268
11.5	41.81	13	87.72	282	4.029	81	51.05	251
21.5	41.82	1	90.63	291	4.065	36	53.34	229
31.5	41.71	11	93.53	290	4.061	4	55.38	204
Apr. 10.4	41.48	23	96.28	275	4.021	40	57.15	177
20.4	41.17	31	98.78	250	3.952	69	58.62	147
30.4	40.78	39	100.96	218	3.860	92	59.78	116
May 10.3	40.34	44	102.72	176	3.748	112	60.62	84
20.3	39.85	49	104.02	130	3.624	124	61.14	52
30.3	39.35	50	104.83	81	3.490	134	61.32	18
June 9.3	38.83	52	105.11	28	3.350	140	61.18	14
19.2	38.32	51	104.86	25	3.210	140	60.73	45
29.2	37.84	48	104.10	76	3.072	138	59.96	77
July 9.2	37.40	44	102.84	126	2.941	131	58.91	105
19.2	37.00	40	101.12	172	2.821	120	57.62	129
29.1	36.66	34	98.97	215	2.716	105	56.12	150
Aug. 8.1	36.38	28	96.43	254	2.630	86	54.44	168
18.1	36.17	21	93.57	286	2.568	62	52.66	178
28.0	36.05	12	90.43	314	2.535	33	50.85	181
Sept. 7.0	36.00	5	87.08	335	2.536	1	49.07	178
17.0	36.04	4	83.57	351	2.576	40	47.40	167
27.0	36.17	13	80.00	357	2.660	84	45.91	149
Oct. 6.9	36.40	23	76.41	359	2.789	129	44.70	121
16.9	36.72	32	72.90	351	2.965	176	43.80	90
26.9	37.13	41	69.53	337	3.187	222	43.31	49
Nov. 5.9	37.63	50	66.40	313	3.453	266	43.26	5
15.8	38.21	58	63.56	284	3.757	304	43.67	41
25.8	38.86	65	61.14	242	4.091	334	44.55	88
Dec. 5.8	39.56	70	59.18	196	4.447	356	45.89	134
15.7	40.30	74	57.77	141	4.813	366	47.64	175
25.7	41.06	76	56.93	84	5.177	364	49.77	213
35.7	41.80	74	56.70	23	5.528	351	52.18	241
Mean Place	36.816		101.85		0.898		33.85	
Sec δ, Tan δ	2.892		+2.714		1.172		−0.611	
$D_\psi a$, $D_\omega a$	+0.07		+0.18		+0.06		−0.04	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.1		−0.4		+0.1	

Washington Mean Time.	λ Centauri. Mag. 3.3				υ Leonis. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′	
	11 32		−62 34		11 32		− 0 22	
	s		″		s		″	
Jan. 0.7	4.32		8.05		49.496		43.43	
10.7	4.86	54	10.56	251	49.807	311	45.52	209
20.6	5.35	49	13.48	292	50.093	286	47.47	195
30.6	5.77	42	16.73	325	50.348	255	49.24	177
Feb. 9.6	6.12	35	20.23	350	50.562	214	50.78	154
19.6	6.38	26	23.87	364	50.734	172	52.06	128
Mar. 1.5	6.56	18	27.56	369	50.861	127	53.08	102
11.5	6.67	11	31.22	366	50.945	84	53.82	74
21.5	6.70	3	34.76	354	50.989	44	54.31	49
31.5	6.66	4	38.12	336	50.995	6	54.55	24
Apr. 10.4	6.55	11	41.22	310	50.969	26	54.60	5
20.4	6.39	16	44.03	281	50.918	51	54.47	13
30.4	6.16	23	46.46	243	50.846	72	54.18	29
May 10.3	5.91	25	48.49	203	50.759	87	53.78	40
20.3	5.62	29	50.07	158	50.661	98	53.28	50
30.3	5.30	32	51.17	110	50.558	103	52.71	57
June 9.3	4.96	34	51.78	61	50.452	106	52.08	63
19.2	4.62	34	51.89	11	50.347	105	51.42	66
29.2	4.28	34	51.49	40	50.245	102	50.74	68
July 9.2	3.94	34	50.60	89	50.150	95	50.07	67
19.2	3.63	31	49.24	136	50.064	86	49.42	65
29.1	3.35	28	47.45	179	49.991	73	48.81	61
Aug. 8.1	3.10	25	45.29	216	49.933	58	48.28	53
18.1	2.92	18	42.83	246	49.893	40	47.85	43
28.0	2.79	13	40.15	268	49.877	16	47.56	29
Sept. 7.0	2.73	6	37.34	281	49.888	11	47.43	13
17.0	2.75	2	34.51	283	49.928	40	47.48	5
27.0	2.85	10	31.76	275	50.002	74	47.78	30
Oct. 6.9	3.04	19	29.22	254	50.114	112	48.31	53
16.9	3.33	29	26.98	224	50.265	151	49.13	82
26.9	3.69	36	25.15	183	50.455	190	50.22	109
Nov. 5.9	4.12	43	23.80	135	50.683	228	51.57	135
15.8	4.62	50	23.01	79	50.947	264	53.19	162
25.8	5.17	55	22.82	19	51.238	291	55.01	182
Dec. 5.8	5.75	58	23.27	45	51.552	314	57.00	199
15.7	6.34	59	24.32	105	51.878	326	59.11	211
25.7	6.93	59	25.96	164	52.206	328	61.26	215
35.7	7.49	56	28.14	218	52.526	320	63.38	212
Mean Place	2.145		17.72		48.085		35.07	
Sec δ, Tan δ	2.172		−1.928		1.000		−0.007	
$D_\psi a$, $D_\omega a$	+0.05		−0.13		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.1		−0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Chamæleontis. Mag. 5.7				3 Draconis. Mag. 5.5				ζ Crateris. Mag. 4.9				χ Ursæ Majoris. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 11 33		° ′ −75 26		h m 11 37		° ′ +67 10		h m 11 40		° ′ −17 54		h m 11 41		° ′ +48 13	
	s		″		s		″		s		″		s		″	
Jan. 0.7	57.80		41.75		59.63		69.97		40.746		3.56		48.117		20.09	
10.7	58.70	90	44.05	230	60.29	66	69.89	8 —	41.070	324	5.95	239	48.542	425	19.36	73
20.7	59.51	81	46.82	277	60.90	61	70.43	54	41.368	298	8.39	244	48.938	396	19.17	19 —
30.6	60.21	70	50.01	319	61.44	54	71.55	112	41.632	264	10.81	242	49.294	356	19.52	35
Feb. 9.6	60.78	57	53.51	350	61.90	46	73.21	166	41.857	225	13.14	233	49.598	304	20.38	86
19.6	61.21	43	57.21	370	62.27	37	75.33	212	42.039	182	15.31	217	49.843	245	21.69	131
Mar. 1.5	61.50	29	61.04	383	62.53	26	77.81	248	42.176	137	17.32	201	50.022	179	23.40	171
11.5	61.66	16	64.91	387	62.68	15	80.53	272	42.269	93	19.11	179	50.136	114	25.41	201
21.5	61.66	0	68.71	380	62.70	2 —	83.39	286	42.320	51	20.65	154	50.184	48 —	27.62	221
31.5	61.55	11	72.39	368	62.64	6	86.28	289	42.333	13 —	21.96	131	50.173	11	29.94	232
Apr. 10.4	61.32	23	75.84	345	62.48	16	89.06	278	42.314	19	23.01	105	50.108	65	32.26	232
20.4	60.98	34	79.00	316	62.23	25	91.62	256	42.269	45	23.80	79	49.996	112	34.49	223
30.4	60.53	45	81.83	283	61.91	32	93.90	228	42.200	69	24.36	56	49.847	149	36.53	204
May 10.4	60.00	53	84.25	242	61.53	38	95.80	190	42.114	86	24.67	31	49.669	178	38.34	181
20.3	59.40	60	86.22	197	61.12	41	97.26	146	42.016	98	24.76	9 —	49.470	199	39.83	149
30.3	58.75	65	87.69	147	60.68	44	98.24	98	41.909	107	24.62	14	49.258	212	40.97	114
June 9.3	58.06	69	88.65	96	60.24	44	98.70	46 —	41.797	112	24.27	35	49.042	216	41.72	75
19.2	57.35	71	89.06	41 —	59.79	45	98.66	4	41.683	114	23.73	54	48.827	215	42.07	35 —
29.2	56.63	72	88.92	14	59.37	42	98.10	56	41.570	113	23.00	73	48.621	206	42.01	6
July 9.2	55.93	70	88.25	67	58.97	40	97.05	105	41.461	109	22.11	89	48.427	194	41.54	47
19.2	55.27	66	87.05	120	58.60	37	95.53	152	41.361	100	21.09	102	48.250	177	40.66	88
29.1	54.66	61	85.36	169	58.28	32	93.57	196	41.272	89	19.96	113	48.097	153	39.40	126
Aug. 8.1	54.14	52	83.24	212	58.02	26	91.21	236	41.199	73	18.76	120	47.970	127	37.77	163
18.1	53.71	43	80.75	249	57.81	21	88.50	271	41.144	55	17.55	121	47.873	97	35.82	195
28.1	53.42	29	77.98	277	57.67	14	85.49	301	41.114	30	16.37	118	47.812	61	33.57	225
Sept. 7.0	53.25	17	75.01	297	57.60	7 —	82.25	324	41.110	4 —	15.27	110	47.790	22 —	31.05	252
17.0	53.24	1 —	71.95	306	57.62	2	78.83	342	41.142	32	14.31	96	47.812	22	28.31	274
27.0	53.38	14	68.94	301	57.71	9	75.29	354	41.210	68	13.56	75	47.881	69	25.39	292
Oct. 6.9	53.68	30	66.08	286	57.89	18	71.72	357	41.319	109	13.06	50	48.001	120	22.35	304
16.9	54.14	46	63.48	260	58.15	26	68.19	353	41.469	150	12.87	19 —	48.174	173	19.24	311
26.9	54.76	62	61.25	223	58.49	34	64.76	343	41.662	193	13.02	15	48.401	227	16.14	310
Nov. 5.9	55.49	73	59.50	175	58.92	43	61.52	324	41.896	234	13.54	52	48.681	280	13.10	304
15.8	56.34	85	58.30	120	59.44	52	58.58	294	42.168	272	14.43	89	49.009	328	10.22	288
25.8	57.27	93	57.70	60 —	60.01	57	56.00	258	42.471	303	15.70	127	49.380	371	7.55	267
Dec. 5.8	58.26	99	57.77	7	60.63	62	53.86	214	42.796	325	17.31	161	49.786	406	5.17	238
15.8	59.26	100	58.47	70	61.29	66	52.24	162	43.134	338	19.20	189	50.213	427	3.19	198
25.7	60.24	98	59.82	135	61.97	68	51.19	105	43.475	341	21.33	213	50.650	437	1.66	153
35.7	61.18	94	61.76	194	62.63	66	50.75	44	43.807	332	23.63	230	51.083	433	0.62	104
Mean Place	54.643		53.34		58.134		95.76		39.305		1.32		46.807		42.81	
Sec δ, Tan δ	3.980		−3.853		2.579		+2.377		1.051		−0.323		1.501		+1.119	
$D_\psi a$, $D_\omega a$	+0.05		−0.25		+0.07		+0.16		+0.06		−0.02		+0.06		+0.07	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.1		−0.4		+0.1		−0.4		+0.1		−0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**β Leonis.** (*Denebola.*) Mag. 2.2				**β Virginis.** Mag. 3.8				**Groombridge 1830.** Mag. 6.5				**γ Ursæ Majoris.** Mag. 2.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	11 44		+15 0		11 46		+ 2 12		11 48		+38 17		11 49		+54 7	
	s		″		s		″		s		″		s		″	
Jan. 0.7	57.075	324	76.22	174	29.885	318	67.49	205	20.183	387	40.11	126	35.918	472	78.53	64
10.7	57.399	301	74.48	147	30.203	295	65.44	189	20.570	363	38.85	78	36.390	444	77.89	6
20.7	57.700	269	73.01	113	30.498	265	63.55	168	20.933	329	38.07	29	36.834	401	77.83	53
30.6	57.969	233	71.88	79	30.763	227	61.87	144	21.262	284	37.78	19	37.235	345	78.36	105
Feb. 9.6	58.202	188	71.09	46	30.990	187	60.43	115	21.546	232	37.97	64	37.580	279	79.41	153
19.6	58.390	142	70.63	10	31.177	143	59.28	88	21.778	179	38.61	103	37.859	210	80.94	193
Mar. 1.6	58.532	98	70.53	19	31.320	99	58.40	59	21.957	123	39.64	134	38.069	135	82.87	225
11.5	58.630	54	70.72	45	31.419	58	57.81	33	22.080	68	40.98	160	38.204	61	85.12	244
21.5	58.684	14	71.17	67	31.477	21	57.48	11	22.148	17	42.58	176	38.265	8	87.56	255
31.5	58.698	20	71.84	83	31.498	12	57.37	10	22.165	29	44.34	181	38.257	71	90.11	254
Apr. 10.4	58.678	49	72.67	93	31.486	38	57.47	28	22.136	67	46.15	180	38.186	126	92.65	242
20.4	58.629	73	73.60	98	31.448	60	57.75	41	22.069	98	47.95	168	38.060	171	95.07	223
30.4	58.556	89	74.58	99	31.388	79	58.16	51	21.971	124	49.63	152	37.889	208	97.30	195
May 10.4	58.467	102	75.57	96	31.309	89	58.67	59	21.847	140	51.15	130	37.681	233	99.25	160
20.3	58.365	110	76.53	89	31.220	98	59.26	63	21.707	151	52.45	102	37.448	251	100.85	121
30.3	58.255	115	77.42	80	31.122	103	59.89	66	21.556	157	53.47	71	37.197	259	102.06	78
June 9.3	58.140	114	78.22	66	31.019	103	60.55	67	21.399	157	54.18	38	36.938	250	102.84	34
19.3	58.026	112	78.88	54	30.916	103	61.22	65	21.242	152	54.56	5	36.679	252	103.18	11
29.2	57.914	105	79.42	39	30.813	97	61.87	62	21.090	144	54.61	31	36.427	239	103.07	56
July 9.2	57.809	97	79.81	21	30.716	90	62.49	57	20.946	131	54.30	66	36.188	219	102.51	100
19.2	57.712	86	80.02	4	30.626	80	63.06	50	20.815	113	53.64	99	35.969	196	101.51	141
29.1	57.626	70	80.06	15	30.546	66	63.56	41	20.702	95	52.65	133	35.773	165	100.10	181
Aug. 8.1	57.556	52	79.91	34	30.480	49	63.97	28	20.607	69	51.32	164	35.608	128	98.29	216
18.1	57.504	29	79.57	55	30.431	26	64.25	14	20.538	42	49.68	192	35.480	91	96.13	247
28.1	57.475	4	79.02	77	30.405	2	64.39	2	20.496	9	47.76	219	35.389	45	93.66	275
Sept. 7.0	57.471	27	78.25	98	30.403	28	64.37	23	20.487	27	45.57	242	35.344	4	90.91	297
17.0	57.498	62	77.27	123	30.431	63	64.14	45	20.514	68	43.15	263	35.348	57	87.94	315
27.0	57.560	99	76.04	143	30.494	99	63.69	71	20.582	111	40.52	280	35.405	114	84.79	326
Oct. 7.0	57.659	137	74.61	167	30.593	138	62.98	95	20.693	158	37.72	292	35.519	175	81.53	331
16.9	57.796	180	72.94	186	30.731	180	62.03	123	20.851	206	34.80	300	35.694	236	78.22	329
26.9	57.976	219	71.08	203	30.911	218	60.80	147	21.057	253	31.80	300	35.930	295	74.93	319
Nov. 5.9	58.195	257	69.05	216	31.129	256	59.33	171	21.310	297	28.80	294	36.225	350	71.74	301
15.8	58.452	288	66.89	223	31.385	286	57.62	189	21.607	335	25.86	281	36.575	400	68.73	276
25.8	58.740	314	64.66	225	31.671	311	55.73	204	21.942	366	23.05	259	36.975	440	65.97	240
Dec. 5.8	59.054	329	62.41	219	31.982	325	53.69	214	22.308	387	20.46	231	37.415	468	63.57	199
15.8	59.383	335	60.22	206	32.307	330	51.55	215	22.695	396	18.15	194	37.883	481	61.58	150
25.7	59.718	330	58.16	187	32.637	325	49.40	209	23.091	394	16.21	153	38.364	480	60.08	95
35.7	60.048		56.29		32.962		47.31		23.485		14.68		38.844		59.13	
Mean Place	55.777		89.68		28.561		76.59		18.943		60.49		34.690		102.43	
Sec δ, Tan δ	1.035		+0.268		1.001		+0.038		1.274		+0.790		1.707		+1.383	
$D_\psi a$, $D_\omega a$	+0.06		+0.02		+0.06		0.00		+0.06		+0.05		+0.06		+0.09	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.1		−0.4		+0.1		−0.4		+0.1		−0.4		0.0	

Washington Mean Time.	π Virginis. Mag. 4.6				o Virginis. Mag. 4.2				δ Centauri. Mag. 2.9				ε Corvi. Mag. 3.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 11 56		° ′ + 7 3		h m 12 1		° ′ + 9 10		h m 12 4		° ′ −50 16		h m 12 5		° ′ −22 10	
	s		″		s		″		s		″		s		″	
Jan. 0.7	44.575	322	46.92	196	6.233	324	46.59	193	10.796	442	9.36	227	58.699	338	9.99	231
10.7	44.897	301	44.96	176	6.557	303	44.66	169	11.238	412	11.63	264	59.037	317	12.30	241
20.7	45.198	272	43.20	149	6.860	276	42.97	142	11.650	369	14.27	291	59.354	288	14.71	245
30.6	45.470	237	41.71	121	7.136	240	41.55	112	12.019	320	17.18	313	59.642	251	17.16	241
Feb. 9.6	45.707	195	40.50	91	7.376	199	40.43	79	12.339	264	20.31	324	59.893	208	19.57	232
19.6	45.902	152	39.59	59	7.575	156	39.64	48	12.603	207	23.55	328	60.101	166	21.89	217
Mar. 1.6	46.054	108	39.00	30	7.731	113	39.16	17	12.810	148	26.83	324	60.267	121	24.06	200
11.5	46.162	67	38.70	3	7.844	71	38.99	10	12.958	90	30.07	314	60.388	80	26.06	179
21.5	46.229	29	38.67	21	7.915	32	39.09	35	13.048	39	33.21	296	60.468	43	27.85	154
31.5	46.258	4	38.88	40	7.947	0	39.44	53	13.087	11	36.17	275	60.511	7	29.39	132
Apr. 10.5	46.254	33	39.28	55	7.947	31	39.97	68	13.076	54	38.92	247	60.518	23	30.71	106
20.4	46.221	56	39.83	68	7.916	53	40.65	77	13.022	92	41.39	216	60.495	47	31.77	81
30.4	46.165	75	40.51	73	7.863	74	41.42	83	12.930	126	43.55	182	60.448	69	32.58	57
May 10.4	46.090	88	41.24	77	7.789	88	42.25	85	12.804	155	45.37	144	60.379	85	33.15	31
20.3	46.002	98	42.01	77	7.701	97	43.10	83	12.649	177	46.81	103	60.294	99	33.46	8
30.3	45.904	104	42.78	75	7.604	104	43.93	80	12.472	195	47.84	63	60.195	108	33.54	16
June 9.3	45.800	106	43.53	70	7.500	108	44.73	71	12.277	209	48.47	17	60.087	117	33.38	38
19.3	45.694	106	44.23	64	7.392	108	45.44	65	12.068	216	48.64	25	59.970	119	33.00	59
29.2	45.588	103	44.87	56	7.284	106	46.09	54	11.852	217	48.39	68	59.851	119	32.41	81
July 9.2	45.485	96	45.43	46	7.178	99	46.63	41	11.635	210	47.71	108	59.732	114	31.60	97
19.2	45.389	87	45.89	35	7.079	91	47.04	28	11.425	198	46.63	145	59.618	108	30.63	112
29.2	45.302	74	46.24	20	6.988	79	47.32	13	11.227	178	45.18	180	59.510	96	29.51	123
Aug. 8.1	45.228	60	46.44	7	6.909	62	47.45	3	11.049	149	43.38	206	59.414	78	28.28	128
18.1	45.168	38	46.51	11	6.847	43	47.42	22	10.900	112	41.32	226	59.336	57	27.00	131
28.1	45.130	12	46.40	31	6.804	17	47.20	41	10.788	68	39.06	239	59.279	29	25.69	127
Sept. 7.0	45.118	17	46.09	50	6.787	12	46.79	64	10.720	15	36.67	242	59.250	4	24.42	116
17.0	45.135	49	45.59	74	6.799	44	46.15	86	10.705	44	34.25	235	59.254	42	23.26	101
27.0	45.184	87	44.85	97	6.843	82	45.29	110	10.749	106	31.90	219	59.296	84	22.25	77
Oct. 7.0	45.271	127	43.88	123	6.925	123	44.19	134	10.855	172	29.71	195	59.380	129	21.48	51
16.9	45.398	168	42.65	146	7.048	163	42.85	158	11.027	237	27.76	158	59.509	175	20.97	16
26.9	45.566	208	41.19	169	7.211	205	41.27	170	11.264	298	26.18	115	59.684	221	20.81	20
Nov. 5.9	45.774	247	39.50	188	7.416	244	39.48	196	11.562	355	25.03	66	59.905	261	21.01	59
15.9	46.021	279	37.62	204	7.660	277	37.52	211	11.917	401	24.37	13	60.166	297	21.60	97
25.8	46.300	306	35.58	214	7.937	304	35.41	217	12.318	434	24.24	43	60.463	323	22.57	134
Dec. 5.8	46.606	323	33.44	217	8.241	322	33.24	220	12.752	456	24.67	98	60.786	342	23.91	169
15.8	46.929	330	31.27	213	8.563	330	31.04	213	13.208	461	25.65	151	61.128	349	25.60	196
25.7	47.259	327	29.14	204	8.893	328	28.91	201	13.669	451	27.16	198	61.477	344	27.56	219
35.7	47.586		27.10		9.221		26.90		14.120		29.14		61.821		29.75	
Mean Place	43.329		57.57		5.021		57.92		9.180		17.34		57.370		9.67	
Sec δ, Tan δ	1.008		+0.124		1.013		+0.162		1.565		−1.203		1.080		−0.408	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		+0.01		+0.06		+0.01		+0.06		−0.08		+0.06		−0.03	
$D_\psi\delta$, $D_\omega\delta$	−0.4		0.0		−0.4		0.0		−0.4		0.0		−0.4		0.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	4 H. Draconis. Mag. 5.1				δ Crucis. Mag. 3.1				δ Ursæ Majoris. Mag. 3.4				γ Corvi. Mag. 2.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 12 8		° ′ +78 3		h m 12 10		° ′ −58 17		h m 12 11		° ′ +57 28		h m 12 11		° ′ −17 5	
	s		″		s		″		s		″		s		″	
Jan. 0.7	26.05	115	31.96	18	52.140	521	45.51	210	26.514	509	33.04	79	39.535	335	33.79	225
10.7	27.20	110	31.78	— 49	52.661	485	47.61	253	27.023	486	32.25	18	39.870	313	36.04	231
20.7	28.30	101	32.27	110	53.146	439	50.14	288	27.509	447	32.07	— 41	40.183	286	38.35	229
30.6	29.31	89	33.37	169	53.585	382	53.02	316	27.956	395	32.48	100	40.469	249	40.64	222
Feb. 9.6	30.20	74	35.06	219	53.967	316	56.18	334	28.351	329	33.48	151	40.718	211	42.86	208
19.6	30.94	55	37.25	261	54.283	250	59.52	344	28.680	257	34.99	196	40.929	168	44.94	192
Mar. 1.6	31.49	36	39.86	289	54.533	180	62.96	346	28.937	178	36.95	230	41.097	126	46.86	171
11.5	31.85	16	42.75	308	54.713	115	66.42	340	29.115	100	39.25	256	41.223	85	48.57	149
21.5	32.01	— 4	45.83	311	54.828	50	69.82	327	29.215	25	41.81	269	41.308	48	50.06	125
31.5	31.97	25	48.94	304	54.878	— 9	73.09	307	29.240	— 48	44.50	271	41.356	13	51.31	102
Apr. 10.5	31.72	40	51.98	285	54.869	64	76.16	283	29.192	110	47.21	262	41.369	— 16	52.33	77
20.4	31.32	56	54.83	256	54.805	113	78.99	252	29.082	165	49.83	245	41.353	40	53.10	56
30.4	30.76	70	57.39	217	54.692	156	81.51	217	28.917	209	52.28	218	41.313	61	53.66	34
May 10.4	30.06	80	59.56	173	54.536	193	83.68	178	28.708	246	54.46	184	41.252	79	54.00	12
20.3	29.26	87	61.29	123	54.343	226	85.46	136	28.462	270	56.30	144	41.173	91	54.12	— 8
30.3	28.39	92	62.52	69	54.117	252	86.82	91	28.192	286	57.74	101	41.082	101	54.04	27
June 9.3	27.47	93	63.21	14	53.865	269	87.73	45	27.906	293	58.75	55	40.981	108	53.77	44
19.3	26.54	93	63.35	— 42	53.596	281	88.18	— 3	27.613	293	59.30	7	40.873	112	53.33	61
29.2	25.61	90	62.93	95	53.315	284	88.15	50	27.320	284	59.37	— 41	40.761	113	52.72	77
July 9.2	24.71	85	61.98	149	53.031	280	87.65	96	27.036	269	58.96	88	40.648	110	51.95	89
19.2	23.86	76	60.49	196	52.751	265	86.69	138	26.767	246	58.08	132	40.538	104	51.06	99
29.2	23.10	69	58.53	239	52.486	241	85.31	178	26.521	218	56.76	175	40.434	93	50.07	105
Aug. 8.1	22.41	58	56.14	279	52.245	206	83.53	212	26.303	184	55.01	214	40.341	77	49.02	109
18.1	21.83	46	53.35	313	52.039	161	81.41	238	26.119	142	52.87	249	40.264	58	47.93	107
28.1	21.37	32	50.22	339	51.878	105	79.03	257	25.977	97	50.38	279	40.206	31	46.86	101
Sept. 7.0	21.05	20	46.83	361	51.773	42	76.46	264	25.880	43	47.59	305	40.175	1	45.85	89
17.0	20.85	4	43.22	373	51.731	— 29	73.82	264	25.837	— 13	44.54	324	40.174	— 36	44.96	71
27.0	20.81	— 13	39.49	379	51.760	108	71.18	251	25.850	75	41.30	339	40.210	76	44.25	50
Oct. 7.0	20.94	28	35.70	376	51.868	187	68.67	229	25.925	142	37.91	346	40.286	120	43.75	21
16.9	21.22	44	31.94	366	52.055	267	66.38	197	26.067	209	34.45	346	40.406	165	43.54	— 11
26.9	21.66	61	28.28	345	52.322	343	64.41	153	26.276	276	30.99	338	40.571	209	43.65	43
Nov. 5.9	22.27	75	24.83	317	52.665	408	62.88	105	26.552	340	27.61	321	40.780	249	44.08	80
15.9	23.02	88	21.66	280	53.073	465	61.83	49	26.892	399	24.40	295	41.029	285	44.88	115
25.8	23.90	100	18.86	233	53.538	508	61.34	— 8	27.291	447	21.45	260	41.314	314	46.03	147
Dec. 5.8	24.90	110	16.53	180	54.046	532	61.42	67	27.738	485	18.85	219	41.628	333	47.50	177
15.8	26.00	114	14.73	120	54.578	540	62.09	125	28.223	507	16.66	168	41.961	340	49.27	199
25.7	27.14	116	13.53	56	55.118	531	63.34	177	28.730	512	14.98	113	42.301	337	51.26	217
35.7	28.30		12.97		55.649		65.11		29.242		13.85		42.638		53.43	
Mean Place	25.338		58.69		50.417		55.45		25.585		57.47		38.269		31.84	
Sec δ, Tan δ	4.834		+4.729		1.903		−1.619		1.860		+1.568		1.046		−0.307	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		+0.32		+0.06		−0.11		+0.06		+0.10		+0.06		−0.02	
$D_\psi\delta$, $D_\omega\delta$	−0.4		0.0		−0.4		0.0		−0.4		0.0		−0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	2 Canum Venat. Mag. 5.8				β Chamæleontis. Mag. 4.4				η Virginis. Mag. 4.0				α^1 Crucis. Mag. 1.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	12 12		+41 5		12 13		−78 51		12 15		− 0 13		12 22		−62 38	
	s		″		s		″		s		″		s		″	
Jan. 0.7	5.399	394	78.20	124	36.74	124	31.79	170	46.868	324	8.19	208	6.55	59	50.35	189
10.7	5.793	375	76.96	73	37.98	116	33.49	224	47.192	307	10.27	197	7.14	55	52.24	236
20.7	6.168	344	76.23	21	39.14	105	35.73	272	47.499	281	12.24	178	7.69	51	54.60	276
30.7	6.512	304	76.02	31	40.19	90	38.45	312	47.780	247	14.02	155	8.20	45	57.36	309
Feb. 9.6	6.816	255	76.33	79	41.09	75	41.57	343	48.027	209	15.57	130	8.65	36	60.45	330
19.6	7.071	201	77.12	123	41.84	58	45.00	364	48.236	169	16.87	102	9.01	31	63.75	345
Mar. 1.6	7.272	145	78.35	160	42.42	40	48.64	377	48.405	126	17.89	73	9.32	22	67.20	353
11.5	7.417	88	79.95	187	42.82	24	52.41	381	48.531	87	18.62	48	9.54	15	70.73	349
21.5	7.505	36	81.82	206	43.06	7	56.22	378	48.618	50	19.10	22	9.69	8	74.22	341
31.5	7.541	13	83.88	216	43.13	10	60.00	365	48.668	16	19.32	1	9.77	1	77.63	325
Apr. 10.5	7.528	56	86.04	216	43.03	26	63.65	344	48.684	13	19.33	19	9.78	6	80.88	301
20.4	7.472	92	88.20	207	42.77	41	67.09	318	48.671	37	19.14	33	9.72	11	83.89	275
30.4	7.380	123	90.27	192	42.36	53	70.27	286	48.634	57	18.81	45	9.61	17	86.64	241
May 10.4	7.257	145	92.19	168	41.83	65	73.13	245	48.577	74	18.36	55	9.44	21	89.05	202
20.4	7.112	162	93.87	141	41.18	76	75.58	201	48.503	85	17.81	61	9.23	26	91.07	161
30.3	6.950	173	95.28	108	40.42	84	77.59	152	48.418	95	17.20	65	8.97	29	92.68	116
June 9.3	6.777	177	96.36	73	39.58	90	79.11	100	48.323	101	16.55	68	8.68	31	93.84	68
19.3	6.600	178	97.09	36	38.68	94	80.11	44	48.222	104	15.87	69	8.37	33	94.52	18
29.2	6.422	172	97.45	0	37.74	95	80.55	10	48.118	105	15.18	66	8.04	34	94.70	30
July 9.2	6.250	163	97.45	40	36.79	93	80.45	65	48.013	102	14.52	63	7.70	34	94.40	79
19.2	6.087	152	97.05	78	35.86	88	79.80	119	47.911	96	13.89	58	7.36	32	93.61	126
29.2	5.935	134	96.27	114	34.98	81	78.61	169	47.815	87	13.31	49	7.04	30	92.35	168
Aug. 8.1	5.801	111	95.13	148	34.17	70	76.92	213	47.728	72	12.82	40	6.74	27	90.67	205
18.1	5.690	86	93.65	179	33.47	56	74.79	251	47.656	54	12.42	26	6.47	21	88.62	236
28.1	5.604	53	91.86	211	32.91	40	72.28	279	47.602	30	12.16	11	6.26	15	86.26	259
Sept. 7.1	5.551	17	89.75	236	32.51	22	69.49	300	47.572	2	12.05	7	6.11	8	83.67	272
17.0	5.534	25	87.39	260	32.29	2	66.49	308	47.570	32	12.12	29	6.03	2	80.95	275
27.0	5.559	71	84.79	278	32.27	20	63.41	303	47.602	68	12.41	53	6.05	9	78.20	268
Oct. 7.0	5.630	119	82.01	292	32.47	40	60.38	289	47.670	110	12.94	79	6.14	18	75.52	248
16.9	5.749	170	79.09	301	32.87	62	57.49	262	47.780	152	13.73	106	6.32	28	73.04	219
26.9	5.919	221	76.08	303	33.49	80	54.87	223	47.932	194	14.79	131	6.60	36	70.85	180
Nov. 5.9	6.140	270	73.05	297	34.29	98	52.64	176	48.126	233	16.10	158	6.96	44	69.05	132
15.9	6.410	315	70.08	285	35.27	112	50.88	120	48.359	270	17.68	178	7.40	52	67.73	79
25.8	6.725	351	67.23	262	36.39	121	49.68	60	48.629	298	19.46	196	7.92	56	66.94	20
Dec. 5.8	7.076	377	64.61	234	37.60	127	49.08	6	48.927	318	21.42	209	8.48	59	66.74	39
15.8	7.453	394	62.27	195	38.87	129	49.14	68	49.245	327	23.51	213	9.07	60	67.13	100
25.8	7.847	398	60.32	152	40.16	127	49.82	132	49.572	327	25.64	212	9.67	60	68.13	154
35.7	8.245		58.80		41.43		51.14		49.899		27.76		10.27		69.67	
Mean Place	4.386		99.14		33.732		44.92		45.707		0.36		4.810		61.41	
Sec δ, Tan δ	1.327		+0.873		5.178		−5.081		1.000		−0.004		2.177		−1.934	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		+0.06		+0.07		−0.34		+0.06		0.00		+0.06		−0.13	
$D_\psi\delta$, $D_\omega\delta$	−0.4		−0.1		−0.4		−0.1		−0.4		−0.1		−0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	20 Comæ. Mag. 5.7				δ Corvi. Mag. 3.1				γ Crucis. Mag. 1.6				8 Canum Venat. Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	12 25		+21 20		12 25		−16 3		12 26		−56 39		12 29		+41 47	
	s		″		s		″		s		″		s		″	
Jan. 0.7	40.252	341	25.20	177	41.450	336	54.66	219	41.199	514	24.64	193	54.890	395	29.72	138
10.7	40.593	327	23.43	144	41.786	320	56.85	224	41.713	484	26.57	236	55.285	383	28.34	86
20.7	40.920	301	21.99	105	42.106	292	59.09	223	42.197	443	28.93	273	55.668	355	27.48	32
30.7	41.221	268	20.94	65	42.398	259	61.32	214	42.640	391	31.66	302	56.023	318	27.16	21
Feb. 9.6	41.489	229	20.29	23	42.657	222	63.46	202	43.031	332	34.68	320	56.341	272	27.37	73
19.6	41.718	188	20.06	16	42.879	181	65.48	185	43.363	271	37.88	332	56.613	220	28.10	119
Mar. 1.6	41.906	141	20.22	51	43.060	141	67.33	163	43.634	207	41.20	336	56.833	166	29.29	158
11.6	42.047	98	20.73	82	43.201	100	68.96	142	43.841	142	44.56	331	56.999	110	30.87	189
21.5	42.145	56	21.55	106	43.301	63	70.38	118	43.983	83	47.87	322	57.109	56	32.76	212
31.5	42.201	18	22.61	125	43.364	28	71.56	96	44.066	24	51.09	303	57.165	6	34.88	224
Apr. 10.5	42.219	15	23.86	136	43.392	1	72.52	73	44.090	29	54.12	281	57.171	38	37.12	227
20.4	42.204	43	25.22	140	43.391	27	73.25	52	44.061	78	56.93	254	57.133	78	39.39	221
30.4	42.161	68	26.62	140	43.364	49	73.77	31	43.983	122	59.47	221	57.055	111	41.60	206
May 10.4	42.093	86	28.02	132	43.315	68	74.08	10	43.861	159	61.68	185	56.944	136	43.66	185
20.4	42.007	101	29.34	120	43.247	83	74.18	7	43.702	193	63.53	145	56.808	157	45.51	157
30.3	41.906	111	30.54	106	43.164	94	74.11	26	43.509	222	64.98	102	56.651	172	47.08	126
June 9.3	41.795	119	31.60	88	43.070	104	73.85	42	43.287	242	66.00	57	56.479	180	48.34	91
19.3	41.676	122	32.48	67	42.966	110	73.43	57	43.045	260	66.57	12	56.299	185	49.25	53
29.3	41.554	123	33.15	45	42.856	113	72.86	72	42.785	267	66.69	36	56.114	184	49.78	14
July 9.2	41.431	121	33.60	20	42.743	113	72.14	82	42.518	267	66.33	79	55.930	179	49.92	26
19.2	41.310	113	33.80	3	42.630	108	71.32	91	42.251	257	65.54	123	55.751	168	49.66	64
29.2	41.197	104	33.77	29	42.522	101	70.41	98	41.994	240	64.31	162	55.583	155	49.02	102
Aug. 8.1	41.093	89	33.48	54	42.421	87	69.43	100	41.754	211	62.69	195	55.428	134	48.00	138
18.1	41.004	70	32.94	80	42.334	68	68.43	99	41.543	171	60.74	224	55.294	109	46.62	174
28.1	40.934	47	32.14	106	42.266	44	67.44	93	41.372	122	58.50	243	55.185	80	44.88	205
Sept. 7.1	40.887	17	31.08	131	42.222	13	66.51	82	41.250	64	56.07	255	55.105	45	42.83	233
17.0	40.870	17	29.77	156	42.209	22	65.69	64	41.186	4	53.52	256	55.060	2	40.50	260
27.0	40.887	55	28.21	179	42.231	61	65.05	45	41.190	78	50.96	249	55.058	43	37.90	280
Oct. 7.0	40.942	97	26.42	202	42.292	106	64.60	16	41.268	156	48.47	228	55.101	93	35.10	296
17.0	41.039	140	24.40	220	42.398	150	64.44	13	41.424	233	46.19	197	55.194	146	32.14	308
26.9	41.179	186	22.20	235	42.548	196	64.57	45	41.657	308	44.22	159	55.340	198	29.06	311
Nov. 5.9	41.365	229	19.85	246	42.744	239	65.02	80	41.965	377	42.63	113	55.538	250	25.95	306
15.9	41.594	268	17.39	250	42.983	275	65.82	114	42.342	433	41.50	60	55.788	297	22.89	296
25.8	41.862	301	14.89	247	43.258	306	66.96	143	42.775	480	40.90	4	56.085	338	19.93	276
Dec. 5.8	42.163	324	12.42	238	43.564	327	68.39	173	43.255	510	40.86	53	56.423	368	17.17	246
15.8	42.487	339	10.04	219	43.891	338	70.12	195	43.765	522	41.39	109	56.791	389	14.71	210
25.8	42.826	342	7.85	195	44.229	339	72.07	211	44.287	518	42.48	161	57.180	397	12.61	166
35.7	43.168		5.90		44.568		74.18		44.805		44.09		57.577		10.95	
Mean Place	39.253		40.27		40.268		52.62		39.638		34.58		54.050		50.62	
Sec δ, Tan δ	1.074		+0.391		1.041		−0.288		1.820		−1.520		1.341		+0.894	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		+0.03		+0.06		−0.02		+0.07		−0.10		+0.06		+0.06	
$D_\psi\delta$, $D_\omega\delta$	−0.4		−0.1		−0.4		−0.1		−0.4		−0.1		−0.4		−0.1	

Washington Mean Time.	κ Draconis. Mag. 3.9				β Corvi. Mag. 2.8				24 Comæ seq. Mag. 5.2				α Muscæ. Mag. 2.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	12 30		+70 13		12 30		−22 56		12 31		+18 48		12 32		−68 41	
	s		″		s		″		s		″		s		″	
Jan. 0.7	2.46	74	38.59	68	8.894	347	55.86	218	5.027	338	67.66	186	22.00	73	9.64	163
10.7	3.20	71	37.91	1	9.241	331	58.04	230	5.365	324	65.80	152	22.73	69	11.27	216
20.7	3.91	68	37.90	61	9.572	305	60.34	235	5.689	300	64.28	116	23.42	63	13.43	261
30.7	4.59	61	38.51	124	9.877	271	62.69	235	5.989	269	63.12	77	24.05	56	16.04	298
Feb. 9.6	5.20	52	39.75	178	10.148	233	65.04	227	6.258	232	62.35	37	24.61	48	19.02	326
19.6	5.72	42	41.53	226	10.381	191	67.31	215	6.490	189	61.98	0	25.09	40	22.28	347
Mar. 1.6	6.14	30	43.79	263	10.572	149	69.46	199	6.679	145	61.98	36	25.49	29	25.75	357
11.6	6.44	17	46.42	288	10.721	108	71.45	181	6.824	103	62.34	68	25.78	21	29.32	361
21.5	6.61	6	49.30	302	10.829	70	73.26	158	6.927	62	63.02	92	25.99	11	32.93	356
31.5	6.67	6	52.32	303	10.899	34	74.84	136	6.989	25	63.94	113	26.10	4	36.49	343
Apr. 10.5	6.61	18	55.35	293	10.933	4	76.20	112	7.014	8	65.07	124	26.14	6	39.92	326
20.4	6.43	27	58.28	272	10.937	24	77.32	90	7.006	36	66.31	131	26.08	14	43.18	299
30.4	6.16	35	61.00	241	10.913	48	78.22	65	6.970	59	67.62	132	25.94	20	46.17	267
May 10.4	5.81	42	63.41	203	10.865	68	78.87	42	6.911	80	68.94	128	25.74	27	48.84	233
20.4	5.39	47	65.44	159	10.797	84	79.29	18	6.831	94	70.22	117	25.47	32	51.17	189
30.3	4.92	51	67.03	110	10.713	99	79.47	3	6.737	106	71.39	105	25.15	38	53.06	144
June 9.3	4.41	53	68.13	58	10.614	109	79.44	27	6.631	113	72.44	90	24.77	41	54.50	96
19.3	3.88	54	68.71	5	10.505	118	79.17	47	6.518	120	73.34	70	24.36	43	55.46	44
29.3	3.34	53	68.76	49	10.387	121	78.70	68	6.398	120	74.04	51	23.93	46	55.90	7
July 9.2	2.81	50	68.27	101	10.266	122	78.02	86	6.278	117	74.55	29	23.47	45	55.83	59
19.2	2.31	48	67.26	150	10.144	118	77.16	101	6.161	115	74.84	7	23.02	44	55.24	109
29.2	1.83	44	65.76	196	10.026	111	76.15	114	6.046	105	74.91	18	22.58	42	54.15	156
Aug. 8.1	1.39	38	63.80	239	9.915	97	75.01	122	5.941	91	74.73	40	22.16	36	52.59	197
18.1	1.01	32	61.41	276	9.818	77	73.79	126	5.850	72	74.33	67	21.80	31	50.62	233
28.1	0.69	23	58.65	310	9.741	53	72.53	125	5.778	51	73.66	90	21.49	23	48.29	262
Sept. 7.1	0.46	17	55.55	335	9.688	20	71.28	117	5.727	21	72.76	117	21.26	12	45.67	280
17.0	0.29	7	52.20	356	9.668	17	70.11	104	5.706	12	71.59	140	21.14	4	42.87	288
27.0	0.22	2	48.64	369	9.685	60	69.07	85	5.718	48	70.19	165	21.10	8	39.99	286
Oct. 7.0	0.24	12	44.95	374	9.745	105	68.22	59	5.766	91	68.54	187	21.18	19	37.13	272
17.0	0.36	24	41.21	372	9.850	152	67.63	28	5.857	135	66.67	209	21.37	31	34.41	245
26.9	0.60	33	37.49	358	10.002	200	67.35	6	5.992	180	64.58	224	21.68	43	31.96	210
Nov. 5.9	0.93	44	33.91	339	10.202	245	67.41	42	6.172	223	62.34	237	22.11	54	29.86	163
15.9	1.37	53	30.52	308	10.447	283	67.83	81	6.395	262	59.97	243	22.65	59	28.23	112
25.8	1.90	61	27.44	270	10.730	316	68.64	117	6.657	295	57.54	244	23.24	67	27.11	54
Dec. 5.8	2.51	69	24.74	221	11.046	338	69.81	152	6.952	319	55.10	237	23.91	72	26.57	8
15.8	3.20	72	22.53	167	11.384	350	71.33	180	7.271	334	52.73	223	24.63	73	26.65	69
25.8	3.92	74	20.86	105	11.734	349	73.13	205	7.605	339	50.50	199	25.36	74	27.34	127
35.7	4.66		19.81		12.083		75.18		7.944		48.51		26.10		28.61	
Mean Place	2.077		64.53		7.697		56.27		4.052		81.81		20.162		21.93	
Sec δ, Tan δ	2.956		+2.782		1.086		−0.424		1.057		+0.341		2.752		−2.564	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.05		+0.18		+0.06		−0.03		+0.06		+0.02		+0.07		−0.17	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.4		−0.1		−0.4		−0.1		−0.4		−0.1		−0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Virginis. Mag. 4.8				γ Centauri. Mag. 2.4				γ Virginis (*mean*). Mag. 2.9				ρ Virginis. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	12 35		− 7 33		12 37		−48 30		12 37		− 1 0		12 37		+10 40	
	s		″		s		″		s		″		s		″	
Jan. 0.7	4.908	331	4.90	213	3.909	446	46.44	193	34.405	327	26.33	208	48.096	331	42.86	199
10.7	5.239	315	7.03	207	4.355	427	48.37	229	34.732	313	28.41	198	48.427	319	40.87	175
20.7	5.554	292	9.10	199	4.782	392	50.66	261	35.045	291	30.39	181	48.746	296	39.12	147
30.7	5.846	262	11.09	184	5.174	351	53.27	283	35.336	261	32.20	158	49.042	265	37.65	113
Feb. 9.6	6.108	225	12.93	162	5.525	302	56.10	298	35.597	225	33.78	134	49.307	231	36.52	79
19.6	6.333	188	14.55	140	5.827	251	59.08	306	35.822	188	35.12	106	49.538	190	35.73	45
Mar. 1.6	6.521	146	15.95	115	6.078	196	62.14	305	36.010	147	36.18	77	49.728	149	35.28	11
11.6	6.667	108	17.10	91	6.274	144	65.19	299	36.157	108	36.95	52	49.877	109	35.17	— 19
21.5	6.775	71	18.01	66	6.418	91	68.18	288	36.265	71	37.47	25	49.986	71	35.36	45
31.5	6.846	38	18.67	44	6.509	46	71.06	270	36.336	38	37.72	4	50.057	35	35.81	67
Apr. 10.5	6.884	7	19.11	22	6.555	1	73.76	247	36.374	7	37.76	— 17	50.092	4	36.48	82
20.4	6.891	— 19	19.33	4	6.556	— 41	76.23	221	36.381	— 19	37.59	31	50.096	— 24	37.30	93
30.4	6.872	41	19.37	— 12	6.515	76	78.44	192	36.362	41	37.28	45	50.072	46	38.23	100
May 10.4	6.831	59	19.25	26	6.439	109	80.36	157	36.321	59	36.83	54	50.026	66	39.23	101
20.4	6.772	75	18.99	38	6.330	137	81.93	122	36.262	76	36.29	62	49.960	81	40.24	99
30.3	6.697	86	18.61	48	6.193	162	83.15	84	36.186	87	35.67	66	49.879	93	41.23	93
June 9.3	6.611	96	18.13	57	6.031	181	83.99	45	36.099	96	35.01	68	49.786	102	42.16	85
19.3	6.515	103	17.56	63	5.850	195	84.44	3	36.003	104	34.33	69	49.684	108	43.01	73
29.3	6.412	108	16.93	71	5.655	205	84.47	— 39	35.899	106	33.64	67	49.576	111	43.74	61
July 9.2	6.304	108	16.22	71	5.450	208	84.08	77	35.793	108	32.97	64	49.465	112	44.35	47
19.2	6.196	106	15.51	73	5.242	202	83.31	115	35.685	106	32.33	59	49.353	108	44.82	30
29.2	6.090	99	14.78	70	5.040	192	82.16	147	35.579	99	31.74	52	49.245	102	45.12	14
Aug. 8.1	5.991	87	14.08	68	4.848	171	80.69	179	35.480	88	31.22	42	49.143	90	45.26	— 5
18.1	5.904	71	13.40	60	4.677	143	78.90	201	35.392	72	30.80	30	49.053	72	45.21	26
28.1	5.833	49	12.80	49	4.534	104	76.89	219	35.320	51	30.50	15	48.981	53	44.95	47
Sept. 7.1	5.784	20	12.31	34	4.430	57	74.70	227	35.269	24	30.35	— 3	48.928	25	44.48	70
17.0	5.764	— 12	11.97	15	4.373	2	72.43	226	35.245	— 9	30.38	24	48.903	— 8	43.78	92
27.0	5.776	51	11.82	— 6	4.371	— 56	70.17	215	35.254	45	30.62	46	48.911	43	42.86	118
Oct. 7.0	5.827	91	11.88	33	4.427	122	68.02	197	35.299	87	31.08	72	48.954	85	41.68	141
17.0	5.918	137	12.21	60	4.549	188	66.05	167	35.386	130	31.80	97	49.039	128	40.27	165
26.9	6.055	181	12.81	89	4.737	252	64.38	131	35.516	174	32.77	125	49.167	173	38.62	187
Nov. 5.9	6.236	223	13.70	119	4.989	312	63.07	86	35.690	217	34.02	150	49.340	215	36.75	205
15.9	6.459	262	14.89	145	5.301	364	62.21	39	35.907	255	35.52	173	49.555	254	34.70	217
25.8	6.721	292	16.34	170	5.665	407	61.82	— 13	36.162	286	37.25	190	49.809	286	32.53	226
Dec. 5.8	7.013	316	18.04	189	6.072	434	61.95	66	36.448	311	39.15	204	50.095	312	30.27	227
15.8	7.329	328	19.93	203	6.506	450	62.61	117	36.759	324	41.19	211	50.407	326	28.00	222
25.8	7.657	332	21.96	211	6.956	450	63.78	164	37.083	327	43.30	211	50.733	331	25.78	207
35.7	7.989		24.07		7.406		65.42		37.410		45.41		51.064		23.71	
Mean Place	3.824		0.02		2.544		54.69		33.369		19.17		47.123		54.12	
Sec δ, Tan δ	1.009		−0.133		1.510		−1.131		1.000		−0.018		1.018		+0.189	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.06		−0.01		+0.07		−0.07		+0.06		0.00		+0.06		+0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.4		−0.2		−0.4		−0.2		−0.4		−0.2		−0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	76 Ursæ Majoris. Mag. 5.9		β Crucis. Mag. 1.5		31 Comæ. Mag. 5.1		η Centauri. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 12 38	° ′ +63 8	h m 12 42	° ′ −59 14	h m 12 47	° ′ +27 58	h m 12 48	° ′ −39 44
	s	″	s	″	s	″	s	″
Jan. 0.8	2.35	62.37	60.088	35.76	46.050	35.54	57.892	12.95
	58	97	553	168	353	179	402	191
10.7	2.93	61.40	60.641	37.44	46.403	33.75	58.294	14.86
	57	33	527	215	344	140	388	221
20.7	3.50	61.07	61.168	39.59	46.747	32.35	58.682	17.07
	54	31	490	254	324	94	360	244
30.7	4.04	61.38	61.658	42.13	47.071	31.41	59.042	19.51
	48	93	439	285	293	48	326	262
Feb. 9.6	4.52	62.31	62.097	44.98	47.364	30.93	59.368	22.13
	42	149	381	311	256	2	284	270
19.6	4.94	63.80	62.478	48.09	47.620	30.91	59.652	24.83
	35	199	317	325	213	43	239	273
Mar. 1.6	5.29	65.79	62.795	51.34	47.833	31.34	59.891	27.56
	24	238	251	333	169	83	193	268
11.6	5.53	68.17	63.046	54.67	48.002	32.17	60.084	30.24
	16	268	184	334	123	117	147	259
21.5	5.69	70.85	63.230	58.01	48.125	33.34	60.231	32.83
	8	286	120	327	79	143	103	245
31.5	5.77	73.71	63.350	61.28	48.204	34.77	60.334	35.28
	2	292	58	314	39	163	61	228
Apr. 10.5	5.75	76.63	63.408	64.42	48.243	36.40	60.395	37.56
	9	287	2	293	2	174	23	205
20.5	5.66	79.50	63.406	67.35	48.245	38.14	60.418	39.61
	16	272	55	269	32	178	12	182
30.4	5.50	82.22	63.351	70.04	48.213	39.92	60.406	41.43
	24	245	106	240	59	174	41	153
May 10.4	5.26	84.67	63.245	72.44	48.154	41.66	60.365	42.96
	28	212	152	205	84	164	73	125
20.4	4.98	86.79	63.093	74.49	48.070	43.30	60.292	44.21
	32	173	191	167	101	149	96	95
30.3	4.66	88.52	62.902	76.16	47.969	44.79	60.196	45.16
	35	127	228	124	118	129	119	62
June 9.3	4.31	89.79	62.674	77.40	47.851	46.08	60.077	45.78
	37	79	256	81	128	104	137	28
19.3	3.94	90.58	62.418	78.21	47.723	47.12	59.940	46.06
	37	30	278	34	135	78	151	5
29.3	3.57	90.88	62.140	78.55	47.588	47.90	59.789	46.01
	38	24	291	14	140	50	163	40
July 9.2	3.19	90.64	61.849	78.41	47.448	48.40	59.626	45.61
	36	72	297	59	140	19	167	73
19.2	2.83	89.92	61.552	77.82	47.308	48.59	59.459	44.88
	35	121	293	105	137	11	165	102
29.2	2.48	88.71	61.259	76.77	47.171	48.48	59.294	43.86
	31	168	277	147	129	41	159	131
Aug. 8.2	2.17	87.03	60.982	75.30	47.042	48.07	59.135	42.55
	29	210	249	184	115	73	146	155
18.1	1.88	84.93	60.733	73.46	46.927	47.34	58.989	41.00
	22	250	210	215	98	104	122	172
28.1	1.66	82.43	60.523	71.31	46.829	46.30	58.867	39.28
	19	283	161	240	75	132	94	185
Sept. 7.1	1.47	79.60	60.362	68.91	46.754	44.98	58.773	37.43
	13	314	98	257	47	162	55	190
17.0	1.34	76.46	60.264	66.34	46.707	43.36	58.718	35.53
	6	336	28	262	12	188	10	187
27.0	1.28	73.10	60.236	63.72	46.695	41.48	58.708	33.66
	1	354	51	257	27	214	40	176
Oct. 7.0	1.29	69.56	60.287	61.15	46.722	39.34	58.748	31.90
	9	363	134	243	70	234	97	155
17.0	1.38	65.93	60.421	58.72	46.792	37.00	58.845	30.35
	17	365	219	217	117	254	155	129
26.9	1.55	62.28	60.640	56.55	46.909	34.46	59.000	29.06
	27	358	300	181	166	266	212	93
Nov. 5.9	1.82	58.70	60.940	54.74	47.075	31.80	59.212	28.13
	33	343	378	139	212	274	266	55
15.9	2.15	55.27	61.318	53.35	47.287	29.06	59.478	27.58
	41	317	444	88	256	275	315	9
25.9	2.56	52.10	61.762	52.47	47.543	26.31	59.793	27.49
	47	285	497	34	294	268	354	36
Dec. 5.8	3.03	49.25	62.259	52.13	47.837	23.63	60.147	27.85
	52	240	534	23	323	253	383	82
15.8	3.55	46.85	62.793	52.36	48.160	21.10	60.530	28.67
	57	189	554	80	344	231	400	129
25.8	4.12	44.96	63.347	53.16	48.504	18.79	60.930	29.96
	58	134	556	135	353	200	404	167
35.7	4.70	43.62	63.903	54.51	48.857	16.79	61.334	31.63
Mean Place	1.913	87.31	58.614	46.59	45.254	52.25	56.689	19.02
Sec δ, Tan δ	2.214	+1.975	1.956	−1.680	1.132	+0.531	1.301	−0.831
$D_\psi\alpha$, $D_\omega\alpha$	+0.05	+0.13	+0.07	−0.11	+0.06	+0.03	+0.07	−0.05
$D_\psi\delta$, $D_\omega\delta$	−0.4	−0.2	−0.4	−0.2	−0.4	−0.2	−0.4	−0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Ursæ Majoris. (*Alioth.*) Mag. 1.7				δ Virginis. Mag. 3.7				α Can. Ven. *seq.* Mag. 2.9				δ Muscæ. Mag. 3.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 12 50		° ′ +56 23		h m 12 51		° ′ + 3 49		h m 12 52		° ′ +38 44		h m 12 56		° ′ −71 6	
	s		″		s		″		s		″		s		″	
Jan. 0.8	28.645		33.70		32.277		65.99		15.139		60.36		42.04		31.05	
10.7	29.140	495	32.43	127	32.605	328	63.94	205	15.523	384	58.72	164	42.86	82	32.29	124
20.7	29.627	487	31.77	66	32.923	318	62.04	190	15.899	376	57.57	115	43.66	80	34.08	179
30.7	30.088	461	31.72	5	33.220	297	60.37	167	16.253	354	56.94	63	44.40	74	36.36	228
Feb. 9.6	30.510	422	32.30	58	33.490	270	58.94	143	16.577	324	56.86	8	45.09	69	39.06	270
19.6	30.879	369	33.44	114	33.727	237	57.82	112	16.860	283	57.30	44	45.69	60	42.09	303
Mar. 1.6	31.185	306	35.10	166	33.926	199	57.01	81	17.097	237	58.22	92	46.19	50	45.36	327
11.6	31.421	236	37.20	210	34.086	160	56.50	51	17.283	186	59.57	135	46.59	40	48.80	344
21.5	31.586	165	39.62	242	34.207	121	56.29	21	17.419	136	61.27	170	46.91	32	52.36	356
31.5	31.677	91	42.29	267	34.291	84	56.33	4	17.504	85	63.24	197	47.12	21	55.93	357
Apr. 10.5	31.698	21	45.06	277	34.343	52	56.61	28	17.541	37	65.39	215	47.22	10	59.41	348
20.5	31.654	44	47.85	279	34.362	19	57.06	45	17.535	6	67.61	222	47.24	2	62.78	337
30.4	31.552	102	50.53	268	34.354	8	57.66	60	17.491	44	69.83	222	47.16	8	65.93	315
May 10.4	31.398	154	53.01	248	34.323	31	58.38	72	17.412	79	71.94	211	47.00	16	68.82	289
20.4	31.201	197	55.22	221	34.271	52	59.16	78	17.304	108	73.90	196	46.75	25	71.38	256
30.3	30.971	230	57.09	187	34.202	69	59.96	80	17.175	129	75.61	171	46.44	31	73.57	219
June 9.3	30.713	258	58.55	146	34.119	83	60.77	81	17.027	148	77.06	145	46.06	38	75.32	175
19.3	30.437	276	59.57	102	34.025	94	61.55	78	16.864	163	78.17	111	45.62	44	76.62	130
29.3	30.150	287	60.12	55	33.922	103	62.29	74	16.694	170	78.94	77	45.13	49	77.41	79
July 9.2	29.860	290	60.19	7	33.813	109	62.96	67	16.519	175	79.33	39	44.62	51	77.69	28
19.2	29.575	285	59.79	40	33.701	112	63.55	59	16.345	174	79.35	2	44.10	52	77.44	25
29.2	29.299	276	58.90	89	33.589	112	64.04	49	16.175	170	78.98	37	43.59	51	76.67	77
Aug. 8.2	29.043	256	57.56	134	33.482	107	64.42	38	16.015	160	78.22	76	43.10	49	75.41	126
18.1	28.811	232	55.79	177	33.385	97	64.65	23	15.869	146	77.10	112	42.64	46	73.68	173
28.1	28.611	200	53.62	217	33.301	84	64.73	8	15.744	125	75.62	148	42.24	40	71.55	213
Sept. 7.1	28.450	161	51.08	254	33.239	62	64.64	9	15.644	100	73.81	181	41.92	32	69.08	247
17.0	28.335	115	48.24	284	33.202	37	64.34	30	15.577	67	71.69	212	41.70	22	66.37	271
27.0	28.274	61	45.11	313	33.195	7	63.83	51	15.548	29	69.29	240	41.59	11	63.50	287
Oct. 7.0	28.272	2	41.79	332	33.226	31	63.08	75	15.563	15	66.63	266	41.61	2	60.58	292
17.0	28.334	62	38.31	348	33.298	72	62.07	101	15.625	62	63.79	284	41.76	15	57.74	284
26.9	28.466	132	34.77	354	33.413	115	60.83	124	15.739	114	60.79	300	42.03	27	55.09	265
Nov. 5.9	28.666	200	31.24	353	33.573	160	59.35	148	15.906	167	57.71	308	42.44	41	52.72	237
15.9	28.936	270	27.80	344	33.777	204	57.62	173	16.125	219	54.62	309	42.97	53	50.77	195
25.9	29.270	334	24.54	326	34.021	244	55.72	190	16.393	268	51.60	302	43.60	63	49.29	148
Dec. 5.8	29.663	393	21.58	296	34.298	277	53.67	205	16.704	311	48.73	287	44.32	72	48.38	91
15.8	30.102	439	18.98	260	34.602	304	51.52	215	17.049	345	46.10	263	45.10	78	48.04	34
25.8	30.574	472	16.84	214	34.922	320	49.36	216	17.418	369	43.78	232	45.91	81	48.31	27
35.7	31.066	492	15.21	163	35.249	327	47.25	211	17.799	381	41.87	191	46.74	83	49.19	88
Mean Place	28.231		57.31		31.350		74.59		14.477		80.03		40.410		44.10	
Sec δ, Tan δ	1.806		+1.505		1.002		+0.067		1.282		+0.803		3.090		−2.923	
Dψα, Dωα	+0.05		+0.10		+0.06		0.00		+0.06		+0.05		+0.08		−0.19	
Dψδ, Dωδ	−0.4		−0.2		−0.4		−0.2		−0.4		−0.2		−0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**ε Virginis.** Mag. 3.0				**θ Virginis.** Mag. 4.4				**43 Comæ.** Mag. 4.3				**20 Canum Venat.** Mag. 4.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 12 58 s		° ′ +11 23 ″		h m 13 5 s		° ′ − 5 6 ″		h m 13 8 s		° ′ +28 16 ″		h m 13 13 s		° ′ +40 59 ″	
Jan. 0.8	9.527	331	28.09	201	46.136	332	29.92	205	6.364	350	62.18	191	55.275	390	36.00	179
10.7	9.858	323	26.08	179	46.468	323	31.97	201	6.714	346	60.27	148	55.665	386	34.21	129
20.7	10.181	303	24.29	148	46.791	304	33.98	188	7.060	330	58.79	103	56.051	371	32.92	74
30.7	10.484	278	22.81	115	47.095	280	35.86	170	7.390	302	57.76	56	56.422	344	32.18	19
Feb. 9.7	10.762	244	21.66	79	47.375	247	37.56	150	7.692	269	57.20	8	56.766	307	31.99	37
19.6	11.006	207	20.87	45	47.622	212	39.06	124	7.961	230	57.12	39	57.073	264	32.36	89
Mar. 1.6	11.213	168	20.42	8	47.834	175	40.30	99	8.191	188	57.51	80	57.337	216	33.25	135
11.6	11.381	128	20.34	23	48.009	139	41.29	72	8.379	143	58.31	118	57.553	164	34.60	174
21.6	11.509	91	20.57	50	48.148	101	42.01	49	8.522	100	59.49	146	57.717	113	36.34	205
31.5	11.600	55	21.07	74	48.249	68	42.50	25	8.622	59	60.95	170	57.830	64	38.39	226
Apr. 10.5	11.655	22	21.81	90	48.317	39	42.75	5	8.681	21	62.65	183	57.894	18	40.65	236
20.5	11.677	5	22.71	102	48.356	9	42.80	12	8.702	14	64.48	189	57.912	25	43.01	238
30.4	11.672	31	23.73	109	48.365	15	42.68	28	8.688	42	66.37	187	57.887	63	45.39	232
May 10.4	11.641	52	24.82	111	48.350	36	42.40	39	8.646	70	68.24	180	57.824	95	47.71	215
20.4	11.589	71	25.93	108	48.314	55	42.01	48	8.576	91	70.04	164	57.729	123	49.86	194
30.4	11.518	86	27.01	103	48.259	73	41.53	56	8.485	111	71.68	146	57.606	145	51.80	164
June 9.3	11.432	97	28.04	93	48.186	86	40.97	62	8.374	124	73.14	121	57.461	164	53.44	132
19.3	11.335	108	28.97	82	48.100	97	40.35	64	8.250	136	74.35	96	57.297	177	54.76	96
29.3	11.227	114	29.79	67	48.003	106	39.71	67	8.114	143	75.31	66	57.120	185	55.72	57
July 9.3	11.113	118	30.46	52	47.897	112	39.04	67	7.971	148	75.97	36	56.935	190	56.29	17
19.2	10.995	116	30.98	35	47.785	115	38.37	65	7.823	147	76.33	4	56.745	189	56.46	25
29.2	10.879	114	31.33	15	47.670	112	37.72	61	7.676	143	76.37	28	56.556	184	56.21	64
Aug. 8.2	10.765	104	31.48	3	47.558	105	37.11	55	7.533	133	76.09	61	56.372	172	55.57	105
18.1	10.661	91	31.45	25	47.453	93	36.56	47	7.400	118	75.48	92	56.200	153	54.52	141
28.1	10.570	71	31.20	46	47.360	73	36.09	35	7.282	98	74.56	124	56.047	129	53.11	179
Sept. 7.1	10.499	46	30.74	71	47.287	49	35.74	19	7.184	71	73.32	154	55.918	100	51.32	213
17.1	10.453	14	30.03	94	47.238	18	35.55	2	7.113	37	71.78	182	55.818	61	49.19	242
27.0	10.439	22	29.09	119	47.220	20	35.53	20	7.076	1	69.96	209	55.757	18	46.77	271
Oct. 7.0	10.461	63	27.90	143	47.240	61	35.73	43	7.077	44	67.87	232	55.739	31	44.06	291
17.0	10.524	107	26.47	168	47.301	105	36.16	70	7.121	93	65.55	252	55.770	85	41.15	310
26.9	10.631	153	24.79	188	47.406	151	36.86	96	7.214	142	63.03	268	55.855	141	38.05	318
Nov. 5.9	10.784	197	22.91	208	47.557	197	37.82	124	7.356	190	60.35	276	55.996	195	34.87	322
15.9	10.981	237	20.83	221	47.754	237	39.06	147	7.546	235	57.59	280	56.191	249	31.65	317
25.9	11.218	274	18.62	229	47.991	274	40.53	171	7.781	277	54.79	274	56.440	296	28.48	302
Dec. 5.8	11.492	302	16.33	231	48.265	302	42.24	188	8.058	311	52.05	261	56.736	336	25.46	279
15.8	11.794	321	14.02	225	48.567	320	44.12	199	8.369	334	49.44	239	57.072	366	22.67	247
25.8	12.115	328	11.77	213	48.887	329	46.11	205	8.703	347	47.05	211	57.438	384	20.20	207
35.8	12.443		9.64		49.216		48.16		9.050		44.94		57.822		18.13	
Mean Place	8.687		39.18		45.242		24.79		5.723		78.47		54.838		55.61	
Sec δ, Tan δ	1.020		+0.201		1.004		−0.089		1.136		+0.538		1.325		+0.869	
Dψα, Dωα	+0.06		+0.01		+0.06		−0.01		+0.06		+0.03		+0.05		+0.06	
Dψδ, Dωδ	−0.4		−0.3		−0.4		−0.3		−0.4		−0.3		−0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**γ Hydræ.** Mag. 3.3				**ι Centauri.** Mag. 2.9				**ζ¹ Ursæ Majoris.** (*Mizar.*) Mag. 2.4				**α Virginis.** (*Spica.*) Mag. 1.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 13 14		° ′ −22 44		h m 13 16		° ′ −36 17		h m 13 20		° ′ +55 20		h m 13 20		° ′ −10 44	
	s		″		s		″		s		″		s		″	
Jan. 0.8	31.794		39.14		3.200		2.02		40.146		30.52		56.245		22.70	
10.7	32.149	355	41.03	189	3.593	393	3.71	169	40.622	476	28.89	163	56.581	336	24.68	198
20.7	32.494	345	43.07	204	3.976	383	5.68	197	41.101	479	27.85	104	56.911	330	26.68	200
30.7	32.821	327	45.19	212	4.340	364	7.89	221	41.565	464	27.44 —	41	57.224	313	28.62	194
Feb. 9.7	33.122	301	47.32	213	4.674	334	10.23	234	41.999	434	27.66	22	57.515	291	30.45	183
19.6	33.391	269	49.39	207	4.973	299	12.66	243	42.389	390	28.49	83	57.775	260	32.11	166
Mar. 1.6	33.626	235	51.38	199	5.232	259	15.11	245	42.726	337	29.88	139	58.001	226	33.59	148
11.6	33.821	195	53.23	185	5.450	218	17.53	242	43.000	274	31.76	187	58.193	192	34.83	124
21.6	33.978	157	54.90	167	5.626	176	19.87	234	43.209	209	34.04	228	58.348	155	35.86	103
31.5	34.098	120	56.40	150	5.760	134	22.08	221	43.348	139	36.62	258	58.467	119	36.65	79
Apr. 10.5	34.183	85	57.71	131	5.856	96	24.12	204	43.420	72	39.39	277	58.554	87	37.23	58
20.5	34.236	53	58.80	109	5.914	58	26.00	188	43.428 —	8	42.23	284	58.609	55	37.60	37
30.4	34.258 —	22	59.70	90	5.937 —	23	27.66	166	43.375	53	45.04	281	58.635	26	37.78	18
May 10.4	34.254	4	60.39	69	5.928	9	29.09	143	43.269	106	47.72	268	58.636 —	1	37.80 —	2
20.4	34.224	30	60.89	50	5.890	38	30.27	118	43.115	154	50.17	245	58.612	24	37.68	12
30.4	34.173	51	61.17	28	5.824	66	31.19	92	42.921	194	52.32	215	58.569	43	37.42	26
June 9.3	34.100	73	61.26 —	9	5.734	90	31.82	63	42.694	227	54.11	179	58.505	64	37.06	36
19.3	34.010	90	61.16	10	5.621	113	32.17	35	42.440	254	55.50	139	58.425	80	36.61	45
29.3	33.905	105	60.87	29	5.490	131	32.23 —	6	42.168	272	56.43	93	58.331	94	36.07	54
July 9.3	33.787	118	60.40	47	5.344	146	31.98	25	41.885	283	56.87 —	44	58.225	106	35.47	60
19.2	33.661	126	59.75	65	5.188	156	31.45	53	41.596	289	56.84	3	58.109	116	34.81	66
29.2	33.531	130	58.96	79	5.027	161	30.63	82	41.309	287	56.33	51	57.989	120	34.11	70
Aug. 8.2	33.401	130	58.03	93	4.867	160	29.56	107	41.031	278	55.35	98	57.869	120	33.40	71
18.1	33.278	123	57.01	102	4.714	153	28.27	129	40.772	259	53.90	145	57.755	114	32.71	69
28.1	33.168	110	55.92	109	4.577	137	26.80	147	40.536	236	52.03	187	57.650	105	32.05	66
Sept. 7.1	33.078	90	54.81	111	4.465	112	25.21	159	40.333	203	49.76	227	57.563	87	31.46	59
17.1	33.016	62	53.73	108	4.385	80	23.54	167	40.172	161	47.12	264	57.500	63	30.97	49
27.0	32.988 —	28	52.73	100	4.346 —	39	21.89	165	40.059	113	44.17	295	57.469 —	31	30.63	34
Oct. 7.0	33.000	12	51.88	85	4.353	7	20.31	158	40.001 —	58	40.96	321	57.474	5	30.49 —	14
17.0	33.059	59	51.24	64	4.414	61	18.89	142	40.007	6	37.56	340	57.521	47	30.55	6
27.0	33.166	107	50.84	40	4.531	117	17.72	117	40.079	72	34.01	355	57.614	93	30.88	33
Nov. 5.9	33.322	156	50.74 —	10	4.704	173	16.82	90	40.222	143	30.42	359	57.756	142	31.48	60
15.9	33.530	208	50.98	24	4.933	229	16.30	52	40.436	214	26.88	354	57.942	186	32.36	88
25.9	33.782	252	51.55	57	5.213	280	16.17 —	13	40.718	282	23.45	343	58.174	232	33.52	116
Dec. 5.8	34.072	290	52.46	91	5.537	324	16.46	29	41.062	344	20.24	321	58.443	269	34.94	142
15.8	34.393	321	53.70	124	5.894	357	17.17	71	41.460	398	17.37	287	58.743	300	36.59	165
25.8	34.734	341	55.23	153	6.272	378	18.28	111	41.900	440	14.91	246	59.063	320	38.40	181
35.8	35.085	351	56.99	176	6.661	389	19.76	148	42.367	467	12.95	196	59.395	332	40.33	193
Mean Place	30.850		40.30		2.190		7.50		40.092		52.99		55.405		19.88	
Sec δ, Tan δ	1.084		−0.419		1.241		−0.734		1.759		+1.447		1.018		−0.190	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		−0.03		+0.07		−0.05		+0.05		+0.09		+0.06		−0.01	
$D_\psi\delta$, $D_\omega\delta$	−0.4		−0.3		−0.4		−0.3		−0.4		−0.3		−0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	Groombridge 2001. Mag. 6.1				70 Virginis. Mag. 5.2				ζ Virginis. Mag. 3.4				17 H. Canum Venat. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 13 24		° ′ +72 48		h m 13 24		° ′ +14 12		h m 13 30		° ′ − 0 10		h m 13 31		° ′ +37 35	
	s		″		s		″		s		″		s		″	
Jan. 0.8	2.87		17.84		28.745		28.30		34.565		61.97		11.275		31.44	
10.8	3.67	80	16.51	133	29.079	334	26.21	209	34.893	328	64.01	204	11.649	374	29.45	199
20.7	4.50	83	15.84	67	29.407	328	24.38	183	35.217	324	65.94	193	12.023	374	27.95	150
30.7	5.30	80	15.84	0	29.721	314	22.88	150	35.527	310	67.71	177	12.386	363	26.97	98
Feb. 9.7	6.06	76	16.51	67	30.013	292	21.74	114	35.817	290	69.25	154	12.726	340	26.55	42
19.6	6.75	69	17.80	129	30.276	263	20.99	75	36.079	262	70.53	128	13.034	308	26.66	11
Mar. 1.6	7.34	59	19.66	186	30.506	230	20.62	37	36.309	230	71.54	101	13.303	269	27.30	64
11.6	7.82	48	22.00	234	30.698	192	20.62	0	36.504	195	72.24	70	13.529	226	28.43	113
21.6	8.18	36	24.73	273	30.851	153	20.97	35	36.663	159	72.67	43	13.708	179	29.96	153
31.5	8.39	21	27.72	299	30.967	116	21.63	66	36.788	125	72.82	15	13.840	132	31.83	187
Apr. 10.5	8.48	9	30.84	312	31.048	81	22.53	90	36.879	91	72.74	8	13.926	86	33.95	212
20.5	8.44	4	33.99	315	31.096	48	23.62	109	36.939	60	72.45	29	13.968	42	36.21	226
30.5	8.28	16	37.03	304	31.113	17	24.85	123	36.970	31	72.01	44	13.970	2	38.54	233
May 10.4	7.98	30	39.88	285	31.103	10	26.14	129	36.976	6	71.43	58	13.934	36	40.83	229
20.4	7.61	37	42.42	254	31.067	36	27.45	131	36.956	20	70.75	68	13.865	69	43.01	218
30.4	7.14	47	44.59	217	31.011	56	28.72	127	36.916	40	70.02	73	13.769	96	45.01	200
June 9.3	6.60	54	46.33	174	30.935	76	29.90	118	36.857	59	69.26	76	13.647	122	46.76	175
19.3	6.01	59	47.58	125	30.844	91	30.97	107	36.779	78	68.50	76	13.505	142	48.23	147
29.3	5.38	63	48.31	73	30.739	105	31.90	93	36.687	92	67.75	75	13.345	160	49.35	112
July 9.3	4.74	64	48.51	20	30.622	117	32.66	76	36.582	105	67.05	70	13.174	171	50.11	76
19.2	4.09	65	48.16	35	30.499	123	33.23	57	36.468	114	66.38	67	12.995	179	50.49	38
29.2	3.44	65	47.29	87	30.372	127	33.60	37	36.348	120	65.79	59	12.814	181	50.51	2
Aug. 8.2	2.82	62	45.89	140	30.244	128	33.75	15	36.226	122	65.29	50	12.634	180	50.11	40
18.2	2.24	58	44.02	187	30.122	122	33.67	8	36.109	117	64.89	40	12.461	173	49.32	79
28.1	1.71	53	41.70	232	30.012	110	33.35	32	36.000	109	64.63	26	12.303	158	48.14	118
Sept. 7.1	1.26	45	38.97	273	29.917	95	32.80	55	35.906	94	64.50	13	12.165	138	46.60	154
17.1	0.88	38	35.89	308	29.845	72	31.98	82	35.836	70	64.55	5	12.054	111	44.72	188
27.0	0.60	28	32.53	336	29.802	43	30.90	108	35.793	43	64.80	25	11.978	76	42.51	221
Oct. 7.0	0.42	18	28.93	360	29.796	6	29.58	132	35.787	6	65.27	47	11.942	36	40.02	249
17.0	0.35	7	25.19	374	29.830	34	27.99	159	35.821	34	65.98	71	11.954	12	37.28	274
27.0	0.40	5	21.38	381	29.908	78	26.18	181	35.899	78	66.92	94	12.016	62	34.34	294
Nov. 5.9	0.58	18	17.58	380	30.033	125	24.14	204	36.024	125	68.13	121	12.133	117	31.25	309
15.9	0.90	32	13.89	369	30.205	172	21.93	221	36.195	171	69.57	144	12.304	171	28.09	316
25.9	1.33	43	10.41	348	30.422	217	19.59	234	36.410	215	71.24	167	12.528	224	24.94	315
Dec. 5.9	1.88	55	7.25	316	30.678	256	17.17	242	36.665	255	73.08	184	12.800	272	21.90	304
15.8	2.53	65	4.49	276	30.966	288	14.75	242	36.950	285	75.06	198	13.114	314	19.02	288
25.8	3.26	73	2.22	227	31.280	314	12.40	235	37.260	310	77.11	205	13.459	345	16.43	259
35.8	4.05	79	0.51	171	31.606	326	10.19	221	37.581	321	79.17	206	13.823	364	14.20	223
Mean Place	3.964		42.44		28.095		39.66		33.844		55.69		10.935		49.58	
Sec δ, Tan δ	3.383		+3.232		1.032		+0.253		1.000		−0.003		1.262		+0.770	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.03		+0.20		+0.06		+0.02		+0.06		0.00		+0.05		+0.05	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Centauri. Mag. 2.6				*m* Virginis. Mag. 5.2				τ Boötis. Mag. 4.5				η Ursæ Majoris. (*Alkaid.*) Mag. 1.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 13 34		° ′ −53 3		h m 13 37		° ′ − 8 17		h m 13 43		° ′ +17 51		h m 13 44		° ′ +49 42	
	s		″		s		″		s		″		s		″	
Jan. 0.8	45.676	498	8.58	114	22.226	332	44.35	195	25.271	330	23.79	212	21.031	424	41.11	197
10.8	46.174	491	9.72	158	22.558	330	46.30	194	25.601	331	21.67	184	21.455	430	39.14	140
20.7	46.665	471	11.30	196	22.888	317	48.24	186	25.932	322	19.83	148	21.885	424	37.74	81
30.7	47.136	442	13.26	227	23.205	295	50.10	173	26.254	302	18.35	108	22.309	402	36.93	20
Feb. 9.7	47.578	401	15.53	253	23.500	269	51.83	154	26.556	277	17.27	66	22.711	369	36.73	— 43
19.7	47.979	355	18.06	271	23.769	239	53.37	133	26.833	244	16.61	23	23.080	326	37.16	100
Mar. 1.6	48.334	305	20.77	282	24.008	204	54.70	110	27.077	209	16.38	— 17	23.406	276	38.16	153
11.6	48.639	253	23.59	288	24.212	168	55.80	86	27.286	172	16.55	54	23.682	221	39.69	197
21.6	48.892	201	26.47	286	24.380	135	56.66	61	27.458	136	17.09	87	23.903	164	41.66	232
31.5	49.093	149	29.33	280	24.515	102	57.27	40	27.594	99	17.96	114	24.067	106	43.98	258
Apr. 10.5	49.242	99	32.13	268	24.617	71	57.67	19	27.693	64	19.10	134	24.173	50	46.56	272
20.5	49.341	49	34.81	250	24.688	41	57.86	2	27.757	33	20.44	147	24.223	— 4	49.28	276
30.5	49.390	2	37.31	231	24.729	14	57.88	— 14	27.790	3	21.91	154	24.219	52	52.04	271
May 10.4	49.392	— 42	39.62	204	24.743	— 9	57.74	27	27.793	— 24	23.45	154	24.167	95	54.75	254
20.4	49.350	85	41.66	174	24.734	33	57.47	37	27.769	47	24.99	150	24.072	135	57.29	232
30.4	49.265	123	43.40	143	24.701	52	57.10	46	27.722	70	26.49	140	23.937	169	59.61	199
June 9.4	49.142	160	44.83	106	24.649	72	56.64	53	27.652	89	27.89	126	23.768	196	61.60	164
19.3	48.982	190	45.89	67	24.577	88	56.11	58	27.563	105	29.15	108	23.572	220	63.24	124
29.3	48.792	216	46.56	28	24.489	103	55.53	62	27.458	120	30.23	89	23.352	236	64.48	81
July 9.3	48.576	235	46.84	— 14	24.386	114	54.91	64	27.338	130	31.12	65	23.116	247	65.29	35
19.2	48.341	244	46.70	55	24.272	121	54.27	65	27.208	137	31.77	42	22.869	251	65.64	— 12
29.2	48.097	248	46.15	94	24.151	124	53.62	64	27.071	139	32.19	15	22.618	250	65.52	58
Aug. 8.2	47.849	239	45.21	131	24.027	122	52.98	61	26.932	137	32.34	— 9	22.368	242	64.94	103
18.2	47.610	219	43.90	165	23.905	112	52.37	55	26.795	128	32.25	37	22.126	226	63.91	148
28.1	47.391	188	42.25	191	23.793	99	51.82	46	26.667	113	31.88	66	21.900	200	62.43	188
Sept. 7.1	47.203	147	40.34	214	23.694	76	51.36	37	26.554	93	31.22	91	21.700	169	60.55	227
17.1	47.056	92	38.20	225	23.618	48	50.99	19	26.461	64	30.31	120	21.531	129	58.28	262
27.1	46.964	31	35.95	230	23.570	12	50.80	2	26.397	29	29.11	147	21.402	81	55.66	293
Oct. 7.0	46.933	— 40	33.65	224	23.558	— 30	50.78	— 20	26.368	— 12	27.64	174	21.321	27	52.73	317
17.0	46.973	115	31.41	208	23.588	75	50.98	44	26.380	56	25.90	197	21.294	— 34	49.56	335
27.0	47.088	191	29.33	185	23.663	123	51.42	71	26.436	104	23.93	219	21.328	98	46.21	348
Nov. 5.9	47.279	265	27.48	150	23.786	171	52.13	96	26.540	153	21.74	237	21.426	163	42.73	351
15.9	47.544	334	25.98	110	23.957	215	53.09	123	26.693	200	19.37	248	21.589	227	39.22	345
25.9	47.878	392	24.88	65	24.172	256	54.32	146	26.893	241	16.89	254	21.816	288	35.77	331
Dec. 5.9	48.270	439	24.23	16	24.428	288	55.78	168	27.134	277	14.35	253	22.104	339	32.46	304
15.8	48.709	471	24.07	— 35	24.716	313	57.46	182	27.411	306	11.82	244	22.443	380	29.42	270
25.8	49.180	491	24.42	83	25.029	326	59.28	191	27.717	322	9.38	227	22.823	411	26.72	227
35.8	49.671		25.25		25.355		61.19		28.039		7.11		23.234		24.45	
Mean Place	44.693		18.70		21.492		41.03		24.772		35.76		21.076		61.52	
Sec δ, Tan δ	1.664		−1.330		1.011		−0.146		1.051		+0.322		1.547		+1.180	
Dψα, Dωα	+0.08		−0.08		+0.06		−0.01		+0.06		+0.02		+0.05		+0.07	
Dψδ, Dωδ	*−0.4*		*−0.4*		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**89 Virginis.** Mag. 5.1				**ζ Centauri.** Mag. 3.1				**η Boötis.** Mag. 2.8				**θ Apodis.** Var. 5.5–6.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	13 45		−17 43		13 50		−46 53		13 50		+18 47		13 57		−76 24	
	s		″		s		″		s		″		s		″	
Jan. 0.8	28.738		52.08		29.520		16.30		50.124		59.74		23.96		9.77	
10.8	29.081	343	53.86	178	29.969	449	17.41	111	50.454	330	57.59	215	25.08	112	9.98	21
20.7	29.423	342	55.74	188	30.416	447	18.89	148	50.786	332	55.72	187	26.21	113	10.77	79
30.7	29.752	329	57.64	190	30.847	431	20.71	182	51.110	324	54.22	150	27.32	111	12.11	134
Feb. 9.7	30.061	309	59.51	187	31.256	409	22.80	209	51.417	307	53.12	110	28.37	105	13.93	182
19.7	30.345	284	61.31	180	31.631	375	25.10	230	51.699	282	52.46	66	29.35	98	16.20	227
Mar. 1.6	30.596	251	62.97	166	31.968	337	27.55	245	51.950	251	52.23	23	30.24	89	18.86	266
11.6	30.814	218	64.48	151	32.262	294	30.09	254	52.166	216	52.41	18	31.02	78	21.81	295
21.6	30.999	185	65.81	133	32.512	250	32.65	256	52.347	181	52.98	57	31.69	67	25.00	319
31.6	31.147	148	66.94	113	32.716	204	35.20	255	52.491	144	53.88	90	32.23	54	28.34	334
Apr. 10.5	31.262	115	67.89	95	32.876	160	37.67	247	52.598	107	55.07	119	32.64	41	31.76	342
20.5	31.347	85	68.63	74	32.992	116	40.03	236	52.670	72	56.46	139	32.91	27	35.19	343
30.5	31.401	54	69.21	58	33.065	73	42.24	221	52.711	41	57.98	152	33.05	14	38.54	335
May 10.4	31.426	25	69.61	40	33.096	31	44.25	201	52.721	10	59.58	160	33.05	0	41.78	324
20.4	31.426	0	69.84	23	33.087	9	46.05	180	52.703	18	61.19	161	32.92	13	44.81	303
30.4	31.400	26	69.93	9	33.041	46	47.58	153	52.660	43	62.74	155	32.67	25	47.58	277
June 9.4	31.352	48	69.87	6	32.959	82	48.83	125	52.594	66	64.20	146	32.29	38	49.99	241
19.3	31.282	70	69.67	20	32.842	117	49.78	95	52.509	85	65.51	131	31.81	48	52.04	205
29.3	31.193	89	69.35	32	32.697	145	50.39	61	52.405	104	66.63	112	31.23	58	53.64	160
July 9.3	31.088	105	68.90	45	32.524	173	50.65	26	52.286	119	67.54	91	30.56	67	54.77	113
19.3	30.969	119	68.34	56	32.332	192	50.55	10	52.156	130	68.22	68	29.85	71	55.36	59
29.2	30.840	129	67.69	65	32.126	206	50.09	46	52.017	139	68.66	44	29.09	76	55 43	7
Aug. 8.2	30.708	132	66.94	75	31.913	213	49.28	81	51.874	143	68.82	16	28.32	77	54.97	46
18.2	30.576	132	66.15	79	31.704	209	48.14	114	51.734	140	68.72	10	27.57	75	53.96	101
28.1	30.451	125	65.32	83	31.506	198	46.72	142	51.600	134	68.34	38	26.87	70	52.47	149
Sept. 7.1	30.343	108	64.50	82	31.333	173	45.04	168	51.481	119	67.67	67	26.24	63	50.51	196
17.1	30.256	87	63.72	78	31.192	141	43.18	186	51.382	99	66.72	95	25.72	52	48.18	233
27.1	30.200	56	63.03	69	31.096	96	41.21	197	51.311	71	65.48	124	25.34	38	45.52	266
Oct. 7.0	30.181	19	62.47	56	31.053	43	39.20	201	51.274	37	63.97	151	25.10	24	42.65	287
17.0	30.205	24	62.09	38	31.071	18	37.24	196	51.278	4	62.19	178	25.04	6	39.67	298
27.0	30.277	72	61.94	15	31.156	85	35.42	182	51.327	49	60.16	203	25.16	12	36.70	297
Nov. 6.0	30.398	121	62.06	12	31.308	152	33.82	160	51.423	96	57.93	223	25.47	31	33.86	284
15.9	30.570	172	62.45	39	31.528	220	32.54	128	51.569	146	55.51	242	25.96	49	31.26	260
25.9	30.789	219	63.14	69	31.813	285	31.61	93	51.762	193	52.98	253	26.62	66	29.01	225
Dec. 5.9	31.050	261	64.12	98	32.152	339	31.10	51	51.998	236	50.38	260	27.44	82	27.19	182
15.8	31.345	295	65.38	126	32.537	385	31.04	6	52.272	274	47.81	257	28.37	93	25.89	130
25.8	31.666	321	66.87	149	32.955	418	31.43	39	52.575	303	45.33	248	29.40	103	25.15	74
35.8	32.002	336	68.55	168	33.392	437	32.26	83	52.896	321	43.02	231	30.49	109	24.99	16
Mean Place	27.996		52.12		28.678		25.05		49.681		71.75		23.197		23.83	
Sec δ, Tan δ	1.050		−0.320		1.463		−1.068		1.056		+0.340		4.256		−4.136	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.06		−0.02		+0.07		−0.06		+0.06		+0.02		+0.11		−0.24	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.4		−0.4		−0.4		−0.5		−0.4		−0.5		−0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	11 Boötis. Mag. 6.1				τ Virginis. Mag. 4.3				β Centauri. Mag. 0.9				π Hydræ. Mag. 3.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 13 57		° ′ +27 46		h m 13 57		° ′ + 1 55		h m 13 58		° ′ −59 58		h m 14 1		° ′ −26 17	
	s		″		s		″		s		″		s		″	
Jan. 0.8	30.460	340	23.68	220	31.925	323	63.26	203	6.462	578	46.83	65	45.961	358	31.00	150
10.8	30.800	346	21.48	181	32.248	325	61.23	192	7.040	580	47.48	114	46.319	360	32.50	169
20.7	31.146	339	19.67	137	32.573	316	59.31	172	7.620	566	48.62	158	46.679	350	34.19	182
30.7	31.485	323	18.30	90	32.889	300	57.59	149	8.186	538	50.20	198	47.029	333	36.01	188
Feb. 9.7	31.808	298	17.40	39	33.189	277	56.10	121	8.724	498	52.18	230	47.362	307	37.89	190
19.7	32.106	267	17.01	11	33.466	248	54.89	91	9.222	451	54.48	257	47.669	279	39.79	186
Mar. 1.6	32.373	232	17.12	57	33.714	217	53.98	59	9.673	397	57.05	276	47.948	244	41.65	179
11.6	32.605	193	17.69	101	33.931	184	53.39	28	10.070	340	59.81	289	48.192	210	43.44	166
21.6	32.798	154	18.70	135	34.115	149	53.11	2	10.410	279	62.70	296	48.402	175	45.10	154
31.6	32.952	114	20.05	166	34.264	118	53.09	25	10.689	220	65.66	296	48.577	142	46.64	139
Apr. 10.5	33.066	76	21.71	186	34.382	88	53.34	45	10.909	158	68.62	291	48.719	108	48.03	122
20.5	33.142	41	23.57	199	34.470	55	53.79	62	11.067	97	71.53	280	48.827	75	49.25	106
30.5	33.183	6	25.56	203	34.525	29	54.41	76	11.164	39	74.33	263	48.902	46	50.31	89
May 10.4	33.189	24	27.59	201	34.554	4	55.17	83	11.203	20	76.96	243	48.948	15	51.20	71
20.4	33.165	52	29.60	191	34.558	22	56.00	88	11.183	75	79.39	215	48.963	13	51.91	53
30.4	33.113	78	31.51	175	34.536	42	56.88	90	11.108	129	81.54	185	48.950	39	52.44	36
June 9.4	33.035	99	33.26	153	34.494	65	57.78	88	10.979	179	83.39	148	48.911	65	52.80	17
19.3	32.936	121	34.79	129	34.429	83	58.66	83	10.800	222	84.87	110	48.846	88	52.97	1
29.3	32.815	136	36.08	101	34.346	99	59.49	78	10.578	261	85.97	69	48.758	109	52.96	20
July 9.3	32.679	149	37.09	70	34.247	114	60.27	69	10.317	289	86.66	24	48.649	126	52.76	38
19.3	32.530	158	37.79	37	34.133	123	60.96	60	10.028	311	86.90	21	48.523	139	52.38	55
29.2	32.372	162	38.16	5	34.010	129	61.56	49	9.717	319	86.69	65	48.384	147	51.83	72
Aug. 8.2	32.210	160	38.21	30	33.881	129	62.05	36	9.398	315	86.04	109	48.237	149	51.11	85
18.2	32.050	154	37.91	65	33.752	124	62.41	21	9.083	297	84.95	148	48.088	143	50.26	98
28.1	31.896	139	37.26	98	33.628	112	62.62	5	8.786	265	83.47	183	47.945	130	49.28	105
Sept. 7.1	31.757	117	36.28	132	33.516	93	62.67	14	8.521	219	81.64	214	47.815	106	48.23	109
17.1	31.640	90	34.96	164	33.423	65	62.53	33	8.302	159	79.50	234	47.709	76	47.14	107
27.1	31.550	54	33.32	193	33.358	33	62.20	56	8.143	86	77.16	246	47.633	37	46.07	101
Oct. 7.0	31.496	11	31.39	222	33.325	6	61.64	79	8.057	4	74.70	250	47.596	8	45.06	88
17.0	31.485	35	29.17	245	33.331	51	60.85	103	8.053	84	72.20	242	47.604	58	44.18	69
27.0	31.520	86	26.72	267	33.382	97	59.82	129	8.137	176	69.78	226	47.662	112	43.49	46
Nov. 6.0	31.606	137	24.05	280	33.479	146	58.53	151	8.313	267	67.52	196	47.774	166	43.03	17
15.9	31.743	189	21.25	289	33.625	191	57.02	172	8.580	351	65.56	161	47.940	217	42.86	13
25.9	31.932	234	18.36	289	33.816	233	55.30	188	8.931	427	63.95	119	48.157	264	42.99	45
Dec. 5.9	32.166	275	15.47	281	34.049	270	53.42	201	9.358	487	62.76	70	48.421	302	43.44	79
15.8	32.441	308	12.66	264	34.319	297	51.41	207	9.845	535	62.06	19	48.723	331	44.23	109
25.8	32.749	330	10.02	239	34.616	314	49.34	207	10.380	564	61.87	32	49.054	351	45.32	135
35.8	33.079		7.63		34.930		47.27		10.944		62.19		49.405		46.67	
Mean Place	30.172		38.10		31.371		69.56		5.649		58.48		45.264		34.04	
Sec δ, Tan δ	1.130		+0.527		1.001		+0.033		1.999		−1.731		1.115		−0.494	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.05		+0.03		+0.06		0.00		+0.08		−0.10		+0.07		−0.03	
, $D_{\omega}\delta$	−0.3		−0.5		−0.3		−0.5		−0.3		−0.5		−0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**θ Centauri.** Mag. 2.3				**α Draconis.** Mag. 3.6				**d Boötis.** Mag. 4.8				**κ Virginis.** Mag. 4.3			
	Right Ascension.		**Declination.**		**Right Ascension.**		**Declination.**		**Right Ascension.**		**Declination.**		**Right Ascension.**		**Declination.**	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	14 1		−35 58		14 2		+64 45		14 6		+25 27		14 8		− 9 53	
	s		″		s		″		s		″		s		″	
Jan. 0.8	55.292	388	13.53	126	10.78	57	23.60	195	42.596	334	75.64	224	34.924	328	52.37	181
10.8	55.680	390	14.79	156	11.35	59	21.65	132	42.930	340	73.40	189	35.252	332	54.18	182
20.8	56.070	381	16.35	179	11.94	59	20.33	68	43.270	335	71.51	146	35.584	324	56.00	177
30.7	56.451	359	18.14	195	12.53	57	19.65	0	43.605	322	70.05	100	35.908	308	57.77	165
Feb. 9.7	56.810	335	20.09	207	13.10	54	19.65	66	43.927	298	69.05	52	36.216	288	59.42	151
19.7	57.145	301	22.16	213	13.64	48	20.31	127	44.225	269	68.53	3	36.504	260	60.93	130
Mar. 1.6	57.446	266	24.29	214	14.12	42	21.58	185	44.494	236	68.50	— 44	36.764	230	62.23	110
11.6	57.712	230	26.43	208	14.54	34	23.43	231	44.730	199	68.94	87	36.994	198	63.33	87
21.6	57.942	190	28.51	202	14.88	24	25.74	269	44.929	161	69.81	124	37.192	165	64.20	63
31.6	58.132	153	30.53	192	15.12	16	28.43	295	45.090	124	71.05	153	37.357	135	64.83	43
Apr. 10.5	58.285	116	32.45	178	15.28	8	31.38	309	45.214	88	72.58	176	37.492	103	65.26	22
20.5	58.401	81	34.23	162	15.36	— 1	34.47	311	45.302	51	74.34	189	37.595	74	65.48	6
30.5	58.482	47	35.85	145	15.35	9	37.58	303	45.353	19	76.23	197	37.669	46	65.54	— 9
May 10.5	58.529	12	37.30	125	15.26	17	40.61	285	45.372	— 12	78.20	196	37.715	19	65.45	23
20.4	58.541	— 19	38.55	105	15.09	23	43.46	257	45.360	40	80.16	188	37.734	— 6	65.22	32
30.4	58.522	49	39.60	83	14.86	31	46.03	221	45.320	67	82.04	174	37.728	31	64.90	41
June 9.4	58.473	80	40.43	58	14.55	34	48.24	181	45.253	89	83.78	155	37.697	54	64.49	48
19.3	58.393	106	41.01	32	14.21	38	50.05	135	45.164	111	85.33	133	37.643	76	64.01	53
29.3	58.287	129	41.33	7	13.83	42	51.40	85	45.053	129	86.66	106	37.567	94	63.48	57
July 9.3	58.158	148	41.40	— 21	13.41	43	52.25	33	44.924	142	87.72	77	37.473	112	62.91	60
19.3	58.010	164	41.19	46	12.98	44	52.58	— 18	44.782	154	88.49	47	37.361	123	62.31	61
29.2	57.846	172	40.73	72	12.54	44	52.40	71	44.628	159	88.96	14	37.238	131	61.70	62
Aug. 8.2	57.674	172	40.01	95	12.10	43	51.69	121	44.469	160	89.10	— 19	37.107	134	61.08	60
18.2	57.502	164	39.06	116	11.67	40	50.48	169	44.309	154	88.91	51	36.973	131	60.48	56
28.2	57.338	150	37.90	132	11.27	37	48.79	215	44.155	141	88.40	85	36.842	118	59.92	50
Sept. 7.1	57.188	122	36.58	144	10.90	32	46.64	256	44.014	122	87.55	117	36.724	101	59.42	40
17.1	57.066	88	35.14	149	10.58	27	44.08	293	43.892	95	86.38	149	36.623	74	59.02	28
27.1	56.978	46	33.65	148	10.31	20	41.15	323	43.797	60	84.89	179	36.549	41	58.74	12
Oct. 7.0	56.932	— 6	32.17	140	10.11	12	37.92	350	43.737	20	83.10	208	36.508	0	58.62	— 6
17.0	56.938	62	30.77	123	9.99	4	34.42	366	43.717	— 27	81.02	232	36.508	44	58.68	30
27.0	57.000	120	29.54	103	9.95	— 6	30.76	377	43.744	76	78.70	255	36.552	94	58.98	52
Nov. 6.0	57.120	179	28.51	73	10.01	16	26.99	376	43.820	127	76.15	270	36.646	143	59.50	79
15.9	57.299	237	27.78	41	10.17	24	23.23	367	43.947	177	73.45	281	36.789	190	60.29	104
25.9	57.536	285	27.37	4	10.41	33	19.56	348	44.124	226	70.64	283	36.979	233	61.33	128
Dec. 5.9	57.821	327	27.33	— 34	10.74	42	16.08	317	44.350	266	67.81	278	37.212	271	62.61	148
15.9	58.148	359	27.67	71	11.16	49	12.91	277	44.616	300	65.03	263	37.483	301	64.09	166
25.8	58.507	378	28.38	106	11.65	54	10.14	229	44.916	321	62.40	242	37.784	318	65.75	176
35.8	58.885		29.44		12.19		7.85		45.237		59.98		38.102		67.51	
Mean Place	54.559		19.44		11.802		45.51		42.338		89.02		34.350		50.27	
Sec δ, Tan δ	1.236		−0.726		2.345		+2.121		1.108		+0.476		1.015		−0.175	
$D_\psi\alpha$, $D_\omega\alpha$	+0.07		−0.04		+0.03		+0.12		+0.05		+0.03		+0.06		−0.01	
$D_\psi\delta$, $D_\omega\delta$	−0.3		−0.5		−0.3		−0.5		−0.3		−0.5		−0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**4 Ursæ Minoris.** Mag. 5.0				**ι Virginis.** Mag. 4.2				**α Boötis.** (*Arcturus.*) Mag. 0.2				**λ Boötis.** Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 14 9		° ′ +77 55		h m 14 11		° ′ − 5 36		h m 14 11		° ′ +19 35		h m 14 13		° ′ +46 27	
	s		″		s		″		s		″		s		″	
Jan. 0.8	4.98	102	18.46	178	46.407	324	55.74	190	58.273	322	61.31	228	18.144	391	16.79	226
10.8	6.00	108	16.68	115	46.731	327	57.64	186	58.595	329	59.03	198	18.535	404	14.53	173
20.8	7.08	111	15.53	48	47.058	321	59.50	177	58.924	325	57.05	162	18.939	404	12.80	117
30.7	8.19	108	15.05	19	47.379	306	61.27	160	59.249	310	55.43	120	19.343	391	11.63	55
Feb. 9.7	9.27	103	15.24	87	47.685	286	62.87	141	59.559	291	54.23	77	19.734	368	11.08	6
19.7	10.30	93	16.11	149	47.971	259	64.28	117	59.850	263	53.46	32	20.102	333	11.14	65
Mar. 1.6	11.23	81	17.60	204	48.230	230	65.45	92	60.113	232	53.14	13	20.435	291	11.79	121
11.6	12.04	65	19.64	249	48.460	197	66.37	66	60.345	197	53.27	51	20.726	245	13.00	170
21.6	12.69	47	22.13	285	48.657	166	67.03	42	60.542	161	53.78	89	20.971	194	14.70	212
31.6	13.16	29	24.98	310	48.823	136	67.45	18	60.703	126	54.67	118	21.165	143	16.82	243
Apr. 10.5	13.45	11	28.08	321	48.959	103	67.63	1	60.829	93	55.85	141	21.308	91	19.25	264
20.5	13.56	8	31.29	320	49.062	75	67.62	20	60.922	59	57.26	157	21.399	41	21.89	275
30.5	13.48	26	34.49	309	49.137	47	67.42	34	60.981	27	58.83	167	21.440	6	24.64	275
May 10.5	13.22	41	37.58	288	49.184	20	67.08	44	61.008	1	60.50	167	21.434	48	27.39	266
20.4	12.81	57	40.46	257	49.204	5	66.64	54	61.007	30	62.17	163	21.386	91	30.05	248
30.4	12.24	69	43.03	218	49.199	31	66.10	59	60.977	54	63.80	154	21.295	126	32.53	223
June 9.4	11.55	82	45.21	175	49.168	52	65.51	62	60.923	78	65.34	140	21.169	159	34.76	193
19.3	10.73	88	46.96	125	49.116	75	64.89	65	60.845	98	66.74	121	21.010	186	36.69	155
29.3	9.85	95	48.21	73	49.041	93	64.24	64	60.747	118	67.95	100	20.824	209	38.24	115
July 9.3	8.90	99	48.94	20	48.948	109	63.60	64	60.629	133	68.95	75	20.615	225	39.39	72
19.3	7.91	100	49.14	35	48.839	123	62.96	61	60.496	144	69.70	51	20.390	238	40.11	27
29.2	6.91	100	48.79	88	48.716	131	62.35	56	60.352	151	70.21	22	20.152	243	40.38	18
Aug. 8.2	5.91	97	47.91	139	48.585	134	61.79	51	60.201	153	70.43	6	19.909	241	40.20	64
18.2	4.94	92	46.52	188	48.451	131	61.28	43	60.048	149	70.37	36	19.668	233	39.56	109
28.2	4.02	85	44.64	233	48.320	119	60.85	33	59.899	138	70.01	65	19.435	215	38.47	152
Sept. 7.1	3.17	74	42.31	274	48.201	103	60.52	19	59.761	119	69.36	94	19.220	190	36.95	193
17.1	2.43	63	39.57	310	48.098	77	60.33	5	59.642	94	68.42	126	19.030	156	35.02	229
27.1	1.80	51	36.47	338	48.021	44	60.28	12	59.548	61	67.16	153	18.874	114	32.73	265
Oct. 7.0	1.29	35	33.09	361	47.977	5	60.40	34	59.487	22	65.63	181	18.760	64	30.08	295
17.0	0.94	17	29.48	375	47.972	39	60.74	56	59.465	23	63.82	206	18.696	7	27.13	317
27.0	0.77	1	25.73	381	48.011	88	61.30	81	59.488	71	61.76	229	18.689	54	23.96	335
Nov. 6.0	0.76	18	21.92	379	48.099	137	62.11	104	59.559	122	59.47	248	18.743	116	20.61	345
15.9	0.94	35	18.13	366	48.236	184	63.15	129	59.681	171	56.99	262	18.859	180	17.16	346
25.9	1.29	54	14.47	342	48.420	227	64.44	150	59.852	216	54.37	268	19.039	241	13.70	338
Dec. 5.9	1.83	71	11.05	309	48.647	265	65.94	169	60.068	256	51.69	268	19.280	294	10.32	320
15.9	2.54	85	7.96	265	48.912	293	67.63	180	60.324	288	49.01	258	19.574	339	7.12	290
25.8	3.39	97	5.31	214	49.205	314	69.43	188	60.612	312	46.43	242	19.913	373	4.22	253
35.8	4.36		3.17		49.519		71.31		60.924		44.01		20.286		1.69	
Mean Place	8.497		41.04		45.878		52.32		57.972		72.75		18.371		35.07	
Sec δ, Tan δ	4.780		+4.674		1.005		−0.098		1.061		+0.356		1.452		+1.052	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	−0.01		+0.26		+0.06		−0.01		+0.06		+0.02		+0.05		+0.06	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		−0.5		−0.3		−0.5		−0.3		−0.5		−0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Virginis. Mag. 4.6				2 Libræ. Mag. 6.3				θ Boötis. Mag. 4.1				f Boötis. Mag. 5.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 14 14		° ′ −12 59		h m 14 19		° ′ −11 20		h m 14 22		° ′ +52 12		h m 14 22		° ′ +19 34	
	s		″		s		″		s		″		s		″	
Jan. 0.8	43.953	331	56.99	172	4.453	327	42.37	174	25.894	416	69.93	232	41.519	320	74.58	227
10.8	44.284	334	58.71	177	4.780	332	44.11	177	26.310	436	67.61	176	41.839	329	72.31	196
20.8	44.618	329	60.48	175	5.112	327	45.88	174	26.746	440	65.85	118	42.168	327	70.35	160
30.7	44.947	315	62.23	167	5.439	314	47.62	164	27.186	430	64.67	52	42.495	316	68.75	120
Feb. 9.7	45.262	292	63.90	156	5.753	293	49.26	151	27.616	407	64.15	10	42.811	296	67.55	75
19.7	45.554	266	65.46	139	6.046	267	50.77	133	28.023	374	64.25	73	43.107	272	66.80	30
Mar. 1.7	45.820	238	66.85	120	6.313	239	52.10	112	28.397	328	64.98	131	43.379	240	66.50	14
11.6	46.058	205	68.05	101	6.552	208	53.22	92	28.725	277	66.29	182	43.619	208	66.64	56
21.6	46.263	173	69.06	79	6.760	176	54.14	69	29.002	222	68.11	225	43.827	173	67.20	91
31.6	46.436	143	69.85	59	6.936	146	54.83	49	29.224	164	70.36	258	44.000	139	68.11	124
Apr. 10.5	46.579	111	70.44	41	7.082	114	55.32	29	29.388	106	72.94	279	44.139	105	69.35	147
20.5	46.690	81	70.85	22	7.196	85	55.61	13	29.494	48	75.73	290	44.244	71	70.82	165
30.5	46.771	54	71.07	8	7.281	57	55.74	2	29.542	7	78.63	291	44.315	41	72.47	175
May 10.5	46.825	26	71.15	5	7.338	29	55.72	15	29.535	58	81.54	282	44.356	10	74.22	177
20.4	46.851	0	71.10	17	7.367	3	55.57	27	29.477	106	84.36	263	44.366	19	75.99	175
30.4	46.851	27	70.93	27	7.370	23	55.30	34	29.371	150	86.99	236	44.347	44	77.74	164
June 9.4	46.824	50	70.66	35	7.347	46	54.96	42	29.221	186	89.35	203	44.303	70	79.38	150
19.4	46.774	73	70.31	43	7.301	71	54.54	48	29.035	220	91.38	164	44.233	91	80.88	134
29.3	46.701	92	69.88	49	7.230	91	54.06	52	28.815	248	93.02	121	44.142	113	82.22	112
July 9.3	46.609	111	69.39	54	7.139	108	53.54	56	28.567	267	94.23	76	44.029	129	83.34	88
19.3	46.498	126	68.85	59	7.031	124	52.98	59	28.300	281	94.99	28	43.900	142	84.22	60
29.2	46.372	134	68.26	62	6.907	133	52.39	60	28.019	289	95.27	20	43.758	151	84.82	34
Aug. 8.2	46.238	137	67.64	63	6.774	138	51.79	60	27.730	288	95.07	69	43.607	155	85.16	5
18.2	46.101	135	67.01	63	6.636	136	51.19	57	27.442	280	94.38	116	43.452	152	85.21	25
28.2	45.966	123	66.38	59	6.500	126	50.62	53	27.162	260	93.22	161	43.300	143	84.96	54
Sept. 7.1	45.843	107	65.79	52	6.374	109	50.09	45	26.902	234	91.61	205	43.157	126	84.42	84
17.1	45.736	80	65.27	43	6.265	83	49.64	34	26.668	197	89.56	243	43.031	102	83.58	115
27.1	45.656	48	64.84	28	6.182	51	49.30	19	26.471	151	87.13	279	42.929	70	82.43	144
Oct. 7.1	45.608	6	64.56	12	6.131	11	49.11	2	26.320	96	84.34	310	42.859	31	80.99	172
17.0	45.602	39	64.44	9	6.120	35	49.09	19	26.224	35	81.24	333	42.828	14	79.27	198
27.0	45.641	89	64.53	33	6.155	84	49.28	43	26.189	31	77.91	352	42.842	61	77.29	222
Nov. 6.0	45.730	141	64.86	58	6.239	133	49.71	67	26.220	102	74.39	360	42.903	112	75.07	240
15.9	45.871	187	65.44	84	6.372	182	50.38	92	26.322	172	70.79	361	43.015	162	72.67	256
25.9	46.058	232	66.28	110	6.554	227	51.30	117	26.494	240	67.18	350	43.177	208	70.11	263
Dec. 5.9	46.290	271	67.38	131	6.781	266	52.47	137	26.734	302	63.68	331	43.385	250	67.48	263
15.9	46.561	301	68.69	151	7.047	296	53.84	156	27.036	355	60.37	300	43.635	283	64.85	255
25.8	46.862	320	70.20	166	7.343	317	55.40	169	27.391	395	57.37	261	43.918	309	62.30	239
35.8	47.182		71.86		7.660		57.09		27.786		54.76		44.227		59.91	
Mean Place	43.394		56.03		3.926		40.97		26.416		88.79		41.283		85.57	
Sec δ, Tan δ	1.026		−0.231		1.020		−0.201		1.632		+1.290		1.061		+0.356	
$D_\psi a$, $D_\omega a$	+0.06		−0.01		+0.07		−0.01		+0.04		+0.07		+0.06		+0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.3		−0.6		−0.3		−0.6		−0.3		−0.6		−0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	φ Virginis. Mag. 5.0				δ Ursæ Minoris. Mag. 4.4				ρ Boötis. Mag. 3.8				γ Boötis. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	14 24		− 1 51		14 27		+76 2		14 28		+30 43		14 28		+38 39	
	s		″		s		″		s		″		s		″	
Jan. 0.8	2.076		59.89		37.27		60.86		20.412		21.16		48.895		27.53	
10.8	2.394	318	61.83	194	38.13	86	58.82	204	20.744	332	18.79	237	49.246	351	25.14	239
20.8	2.717	323	63.69	186	39.06	93	57.40	142	21.089	345	16.82	197	49.612	366	23.20	194
30.7	3.036	319	65.40	171	40.03	97	56.63	77	21.435	346	15.30	152	49.980	368	21.79	141
Feb. 9.7	3.343	307	66.94	154	40.99	96	56.54	9	21.771	336	14.28	102	50.340	360	20.92	87
19.7	3.632	289	68.21	127	41.91	92	57.13	59	22.089	318	13.79	49	50.680	340	20.63	29
Mar. 1.7	3.896	264	69.24	103	42.76	85	58.36	123	22.379	290	13.84	5	50.992	312	20.92	29
11.6	4.133	237	69.97	73	43.52	76	60.17	181	22.639	260	14.40	56	51.271	279	21.76	84
21.6	4.338	205	70.41	44	44.14	62	62.49	232	22.862	223	15.43	103	51.510	239	23.09	133
31.6	4.513	175	70.61	20	44.63	49	65.21	272	23.050	188	16.85	142	51.707	197	24.85	176
Apr. 10.6	4.658	145	70.55	6	44.96	33	68.23	302	23.197	147	18.62	177	51.861	154	26.96	211
20.5	4.771	113	70.26	29	45.13	17	71.41	318	23.306	109	20.64	202	51.971	110	29.31	235
30.5	4.856	85	69.81	45	45.14	1	74.65	324	23.378	72	22.83	219	52.039	68	31.81	250
May 10.5	4.912	56	69.22	59	45.00	14	77.83	318	23.413	35	25.09	226	52.065	26	34.38	257
20.4	4.940	28	68.52	70	44.71	29	80.83	300	23.415	2	27.34	225	52.053	12	36.91	253
30.4	4.943	3	67.76	76	44.28	43	83.58	275	23.384	31	29.52	218	52.005	48	39.32	241
June 9.4	4.920	23	66.97	79	43.74	54	85.98	240	23.322	62	31.54	202	51.922	83	41.55	223
19.4	4.874	46	66.17	80	43.10	64	87.97	199	23.233	89	33.36	182	51.809	113	43.51	196
29.3	4.804	70	65.39	78	42.37	73	89.50	153	23.119	114	34.92	156	51.669	140	45.17	166
July 9.3	4.715	89	64.63	76	41.56	81	90.52	102	22.983	136	36.19	127	51.505	164	46.48	131
19.3	4.608	107	63.94	69	40.72	84	91.02	50	22.828	155	37.13	94	51.322	183	47.42	94
29.3	4.485	123	63.31	63	39.85	87	90.97	5	22.659	169	37.72	59	51.124	198	47.95	53
Aug. 8.2	4.353	132	62.76	55	38.98	87	90.40	57	22.481	178	37.95	23	50.917	207	48.06	11
18.2	4.215	138	62.31	45	38.12	86	89.30	110	22.299	182	37.81	14	50.707	210	47.76	30
28.2	4.079	136	61.97	34	37.30	82	87.70	160	22.120	179	37.30	51	50.501	206	47.04	72
Sept. 7.1	3.951	128	61.77	20	36.52	78	85.63	207	21.952	168	36.41	89	50.307	194	45.90	114
17.1	3.840	111	61.71	6	35.82	70	83.13	250	21.800	152	35.16	125	50.133	174	44.36	154
27.1	3.752	88	61.82	11	35.20	62	80.24	289	21.676	124	33.55	161	49.986	147	42.46	190
Oct. 7.1	3.697	55	62.14	32	34.70	50	77.03	321	21.583	93	31.63	192	49.876	110	40.20	226
17.0	3.677	20	62.66	52	34.33	37	73.54	349	21.532	51	29.38	225	49.810	66	37.62	258
27.0	3.702	25	63.43	77	34.10	23	69.87	367	21.528	4	26.87	251	49.794	16	34.78	284
Nov. 6.0	3.775	73	64.42	99	34.02	8	66.09	378	21.576	48	24.13	274	49.833	39	31.71	307
16.0	3.897	122	65.65	123	34.10	8	62.29	380	21.677	101	21.23	290	49.931	98	28.51	320
25.9	4.067	170	67.10	145	34.35	25	58.56	373	21.832	155	18.22	301	50.086	155	25.24	327
Dec. 5.9	4.281	214	68.75	165	34.76	41	55.02	354	22.037	205	15.20	302	50.296	210	21.98	326
15.9	4.535	254	70.54	179	35.32	56	51.77	325	22.289	252	12.23	297	50.556	260	18.83	315
25.8	4.819	284	72.43	189	36.02	70	48.92	285	22.577	288	9.42	281	50.859	303	15.91	292
35.8	5.125	306	74.36	193	36.84	82	46.53	239	22.896	319	6.86	256	51.194	335	13.28	263
Mean Place	1.637		55.59		40.660		82.13		20.381		34.97		49.034		43.26	
Sec δ, Tan δ	1.001		−0.033		4.149		+4.027		1.163		+0.594		1.281		+0.800	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		0.00		0.00		+0.22		+0.05		+0.03		+0.05		+0.04	
$D_\psi\delta$, $D_\omega\delta$	−0.3		−0.6		−0.3		−0.6		−0.3		−0.6		−0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Centauri. Mag. 2.6				σ Boötis. Mag. 4.5				α² Centauri. Mag. 0.3				33 Boötis. Mag. 5.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	14 30		−41 48		14 31		+30 5		14 34		−60 29		14 35		+44 44	
	s		″		s		″		s		″		s		″	
Jan. 0.8	21.995	409	2.14	80	9.285	331	33.66	238	6.36	57	49.48	23	49.073	368	55.66	245
10.8	22.404	418	2.94	113	9.616	343	31.28	199	6.93	58	49.71	70	49.441	387	53.21	196
20.8	22.822	413	4.07	142	9.959	344	29.29	154	7.51	57	50.41	116	49.828	392	51.25	140
30.7	23.235	400	5.49	166	10.303	336	27.75	105	8.08	56	51.57	156	50.220	386	49.85	82
Feb. 9.7	23.635	378	7.15	184	10.639	318	26.70	53	8.64	52	53.13	191	50.606	369	49.03	20
19.7	24.013	348	8.99	198	10.957	292	26.17	2	9.16	49	55.04	221	50.975	340	48.83	40
Mar. 1.7	24.361	315	10.97	206	11.249	261	26.19	52	9.65	44	57.25	243	51.315	304	49.23	99
11.6	24.676	280	13.03	209	11.510	226	26.71	98	10.09	38	59.68	261	51.619	263	50.22	150
21.6	24.956	241	15.12	209	11.736	190	27.69	139	10.47	33	62.29	271	51.882	217	51.72	195
31.6	25.197	203	17.21	205	11.926	150	29.08	174	10.80	27	65.00	277	52.099	170	53.67	230
Apr. 10.6	25.400	164	19.26	197	12.076	113	30.82	199	11.07	20	67.77	276	52.269	121	55.97	256
20.5	25.564	125	21.23	186	12.189	75	32.81	217	11.27	15	70.53	271	52.390	73	58.53	272
30.5	25.689	86	23.09	174	12.264	40	34.98	224	11.42	7	73.24	259	52.463	26	61.25	277
May 10.5	25.775	49	24.83	156	12.304	6	37.22	225	11.49	2	75.83	244	52.489	18	64.02	273
20.4	25.824	10	26.39	139	12.310	27	39.47	217	11.51	3	78.27	222	52.471	59	66.75	259
30.4	25.834	28	27.78	117	12.283	58	41.64	202	11.48	10	80.49	196	52.412	97	69.34	239
June 9.4	25.806	64	28.95	94	12.225	84	43.66	183	11.38	16	82.45	166	52.315	133	71.73	211
19.4	25.742	97	29.89	68	12.141	111	45.49	157	11.22	20	84.11	131	52.182	164	73.84	176
29.3	25.645	129	30.57	41	12.030	133	47.06	128	11.02	25	85.42	93	52.018	188	75.60	139
July 9.3	25.516	157	30.98	11	11.897	151	48.34	97	10.77	30	86.35	52	51.830	213	76.99	97
19.3	25.359	177	31.09	19	11.746	167	49.31	62	10.47	32	86.87	9	51.617	228	77.96	54
29.3	25.182	192	30.90	48	11.579	176	49.93	26	10.15	34	86.96	34	51.389	239	78.50	9
Aug. 8.2	24.990	199	30.42	78	11.403	180	50.19	11	9.81	34	86.62	78	51.150	242	78.59	37
18.2	24.791	198	29.64	103	11.223	178	50.08	47	9.47	34	85.84	120	50.908	239	78.22	82
28.2	24.593	185	28.61	129	11.045	167	49.61	85	9.13	31	84.64	158	50.669	227	77.40	126
Sept. 7.1	24.408	161	27.32	146	10.878	152	48.76	121	8.82	28	83.06	190	50.442	205	76.14	168
17.1	24.247	127	25.86	161	10.726	126	47.55	157	8.54	22	81.16	217	50.237	176	74.46	208
27.1	24.120	83	24.25	167	10.600	94	45.98	188	8.32	15	78.99	236	50.061	138	72.38	244
Oct. 7.1	24.037	31	22.58	165	10.506	53	44.10	220	8.17	7	76.63	245	49.923	91	69.94	277
17.0	24.006	29	20.93	159	10.453	6	41.90	248	8.10	2	74.18	245	49.832	37	67.17	305
27.0	24.035	93	19.34	143	10.447	46	39.42	269	8.12	11	71.73	235	49.795	21	64.12	325
Nov. 6.0	24.128	158	17.91	120	10.493	98	36.73	287	8.23	21	69.38	214	49.816	84	60.87	339
16.0	24.286	220	16.71	91	10.591	152	33.86	298	8.44	30	67.24	185	49.900	148	57.48	345
25.9	24.506	279	15.80	56	10.743	203	30.88	301	8.74	38	65.39	148	50.048	208	54.03	341
Dec. 5.9	24.785	327	15.24	20	10.946	249	27.87	296	9.12	45	63.91	105	50.256	264	50.62	328
15.9	25.112	368	15.04	19	11.195	286	24.91	281	9.57	51	62.86	57	50.520	311	47.34	303
25.8	25.480	394	15.23	56	11.481	317	22.10	255	10.08	55	62.29	8	50.831	350	44.31	271
35.8	25.874		15.79		11.798		19.55		10.63		62.21		51.181		41.60	
Mean Place	21.420		9.76		9.262		47.16		5.166		66.63		49.437		72.27	
Sec δ, Tan δ	1.342		−0.894		1.156		+0.579		2.031		−1.768		1.408		+0.991	
Dψα, Dωα	+0.08		−0.05		+0.05		+0.03		+0.09		−0.09		+0.04		+0.05	
Dψδ, Dωδ	−0.3		−0.6		−0.3		−0.6		−0.3		−0.6		−0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**α Apodis.** Mag. 3.8				**μ Virginis.** Mag. 4.0				**ε Boötis.** Mag. 2.7				**109 Virginis.** Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 14 37		° ′ −78 41		h m 14 38		° ′ − 5 18		h m 14 41		° ′ +27 24		h m 14 42		° ′ + 2 13	
	s		″		s		″		s		″		s		″	
Jan. 0.8	43.42	130	54.55	46	47.755	315	27.13	182	26.980	321	41.76	240	9.461	309	55.57	198
10.8	44.72	134	54.09	10	48.070	323	28.95	179	27.301	334	39.36	205	9.770	318	53.59	188
20.8	46.06	136	54.19	66	48.393	322	30.74	168	27.635	337	37.31	163	10.088	318	51.71	169
30.8	47.42	132	54.85	120	48.715	313	32.42	154	27.972	331	35.68	116	10.406	309	50.02	147
Feb. 9.7	48.74	128	56.05	167	49.028	295	33.96	135	28.303	315	34.52	65	10.715	294	48.55	119
19.7	50.02	119	57.72	211	49.323	275	35.31	110	28.618	291	33.87	14	11.009	273	47.36	88
Mar. 1.7	51.21	110	59.83	248	49.598	247	36.41	85	28.909	263	33.73	36	11.282	247	46.48	56
11.6	52.31	96	62.31	278	49.845	219	37.26	59	29.172	231	34.09	84	11.529	218	45.92	24
21.6	53.27	84	65.09	303	50.064	191	37.85	33	29.403	195	34.93	125	11.747	190	45.68	5
31.6	54.11	69	68.12	319	50.255	160	38.18	11	29.598	160	36.18	160	11.937	159	45.73	32
Apr. 10.6	54.80	52	71.31	329	50.415	131	38.29	9	29.758	123	37.78	186	12.096	129	46.05	54
20.5	55.32	37	74.60	333	50.546	101	38.20	28	29.881	88	39.64	206	12.225	100	46.59	74
30.5	55.69	21	77.93	328	50.647	73	37.92	42	29.969	52	41.70	215	12.325	71	47.33	87
May 10.5	55.90	3	81.21	318	50.720	46	37.50	51	30.021	19	43.85	218	12.396	44	48.20	96
20.4	55.93	13	84.39	299	50.766	17	36.99	60	30.040	14	46.03	212	12.440	15	49.16	101
30.4	55.80	29	87.38	274	50.783	9	36.39	65	30.026	43	48.15	201	12.455	12	50.17	102
June 9.4	55.51	46	90.12	242	50.774	36	35.74	68	29.983	73	50.16	183	12.443	37	51.19	100
19.4	55.05	58	92.54	204	50.738	60	35.06	68	29.910	98	51.99	160	12.406	63	52.19	95
29.3	54.47	71	94.58	161	50.678	82	34.38	67	29.812	122	53.59	134	12.343	85	53.14	88
July 9.3	53.76	82	96.19	113	50.596	104	33.71	65	29.690	142	54.93	103	12.258	104	54.02	79
19.3	52.94	89	97.32	63	50.492	121	33.06	61	29.548	160	55.96	71	12.154	124	54.81	66
29.3	52.05	93	97.95	8	50.371	133	32.45	56	29.388	171	56.67	37	12.030	135	55.47	55
Aug. 8.2	51.12	94	98.03	48	50.238	140	31.89	49	29.217	176	57.04	2	11.895	142	56.02	42
18.2	50.18	93	97.55	100	50.098	142	31.40	41	29.041	177	57.06	34	11.753	145	56.44	25
28.2	49.25	86	96.55	151	49.956	135	30.99	32	28.864	169	56.72	69	11.608	138	56.69	9
Sept. 7.1	48.39	76	95.04	198	49.821	120	30.67	18	28.695	154	56.03	105	11.470	124	56.78	8
17.1	47.63	63	93.06	237	49.701	99	30.49	4	28.541	130	54.98	139	11.346	104	56.70	30
27.1	47.00	46	90.69	270	49.602	68	30.45	12	28.411	100	53.59	172	11.242	73	56.40	50
Oct. 7.1	46.54	28	87.99	290	49.534	30	30.57	32	28.311	61	51.87	204	11.169	37	55.90	73
17.0	46.26	6	85.09	302	49.504	13	30.89	53	28.250	15	49.83	231	11.132	5	55.17	96
27.0	46.20	17	82.07	300	49.517	60	31.42	77	28.235	35	47.52	256	11.137	53	54.21	121
Nov. 6.0	46.37	39	79.07	288	49.577	110	32.19	99	28.270	87	44.96	274	11.190	102	53.00	143
16.0	46.76	62	76.19	263	49.687	159	33.18	123	28.357	141	42.22	287	11.292	150	51.57	165
25.9	47.38	81	73.56	228	49.846	205	34.41	143	28.498	191	39.35	293	11.442	196	49.92	181
Dec. 5.9	48.19	99	71.28	186	50.051	246	35.84	161	28.689	236	36.42	290	11.638	236	48.11	193
15.9	49.18	113	69.42	137	50.297	278	37.45	173	28.925	275	33.52	279	11.874	271	46.18	201
25.8	50.31	123	68.05	82	50.575	302	39.18	180	29.200	306	30.73	256	12.145	295	44.17	202
35.8	51.54		67.23		50.877		40.98		29.506		28.17		12.440		42.15	
Mean Place	43.585		68.50		47.368		24.29		26.975		54.04		9.149		60.63	
Sec δ, Tan δ	5.106		−5.006		1.004		−0.093		1.126		+0.519		1.001		+0.039	
$D_\psi\alpha$, $D_\omega\alpha$	+0.14		−0.26		+0.06		0.00		+0.05		+0.03		+0.06		0.00	
$D_\psi\delta$, $D_\omega\delta$	−0.3		−0.6		−0.3		−0.6		−0.3		−0.6		−0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	8 Libræ. Mag. 5.3				α Libræ. Mag. 2.9				Groombridge 2164. Mag. 5.7				β Ursæ Minoris. Mag. 2.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 14 46		° ′ −15 39		h m 14 46		° ′ −15 42		h m 14 49		° ′ +59 36		h m 14 50		° ′ +74 28	
	s		″		s		″		s		″		s		″	
Jan. 0.8	12.599		39.72		24.049		20.86		21.735		63.61		52.20		51.90	
10.8	12.925	326	41.21	149	24.372	323	22.35	149	22.186	451	61.12	249	52.95	75	49.58	232
20.8	13.259	334	42.78	157	24.706	334	23.91	156	22.672	486	59.18	194	53.76	81	47.83	175
30.8	13.592	333	44.37	159	25.039	333	25.49	158	23.176	504	57.85	133	54.63	87	46.73	110
Feb. 9.7	13.917	325	45.92	155	25.363	324	27.04	155	23.680	504	57.17	68	55.50	87	46.30	43 —
19.7	14.225	308	47.38	146	25.672	309	28.51	147	24.168	488	57.17	0	56.36	86	46.56	26
Mar. 1.7	14.513	288	48.72	134	25.959	287	29.84	133	24.626	458	57.82	65	57.16	80	47.49	93
11.6	14.774	261	49.90	118	26.222	263	31.02	118	25.040	414	59.08	126	57.88	72	49.03	154
21.6	15.009	235	50.91	101	26.455	233	32.03	101	25.400	360	60.93	185	58.51	63	51.11	208
31.6	15.213	204	51.73	82	26.660	205	32.85	82	25.698	298	63.24	231	59.03	52	53.66	255
Apr. 10.6	15.387	174	52.37	64	26.835	175	33.49	64	25.927	229	65.92	268	59.41	38	56.54	288
20.5	15.533	146	52.85	48	26.981	146	33.97	48	26.087	160	68.86	294	59.64	23	59.67	313
30.5	15.648	115	53.17	32	27.096	115	34.30	33	26.175	88	71.97	311	59.75	11 —	62.91	324
May 10.5	15.735	87	53.34	17	27.183	87	34.48	18	26.194	19 —	75.11	314	59.71	4	66.16	325
20.5	15.791	56	53.40	6 —	27.241	58	34.54	6 —	26.144	50	78.17	306	59.53	18	69.30	314
30.4	15.819	28	53.35	5	27.269	28	34.49	5	26.032	112	81.09	292	59.22	31	72.22	292
June 9.4	15.820	1 —	53.21	14	27.269	0	34.35	14	25.862	170	83.73	264	58.80	42	74.85	263
19.4	15.791	29	52.97	24	27.241	28	34.11	24	25.638	224	86.07	234	58.28	52	77.12	227
29.3	15.736	55	52.66	31	27.186	55	33.81	30	25.368	270	88.01	194	57.66	62	78.96	184
July 9.3	15.655	81	52.29	37	27.104	82	33.44	37	25.058	310	89.52	151	56.98	68	80.32	136
19.3	15.552	103	51.85	44	27.001	103	33.00	44	24.717	341	90.55	103	56.24	74	81.18	86
29.3	15.428	124	51.36	49	26.877	124	32.51	49	24.353	364	91.09	54	55.46	78	81.51	33 —
Aug. 8.2	15.291	137	50.81	55	26.740	137	31.97	54	23.974	379	91.12	3 —	54.66	80	81.31	20
18.2	15.145	146	50.23	58	26.593	147	31.39	58	23.590	384	90.63	49	53.86	80	80.58	73
28.2	14.996	149	49.64	59	26.444	149	30.79	60	23.212	378	89.64	99	53.08	78	79.34	124
Sept. 7.2	14.852	144	49.05	59	26.301	143	30.19	60	22.850	362	88.17	147	52.34	74	77.60	174
17.1	14.723	129	48.48	57	26.171	130	29.62	57	22.515	335	86.23	194	51.64	70	75.40	220
27.1	14.617	106	47.97	51	26.065	106	29.11	51	22.219	296	83.87	236	51.03	61	72.78	262
Oct. 7.1	14.542	75	47.56	41	25.990	75	28.70	41	21.974	245	81.11	276	50.51	52	69.79	299
17.0	14.505	37 —	47.30	26	25.954	36 —	28.43	27	21.789	185	78.01	310	50.09	42	66.50	329
27.0	14.514	9	47.19	11 —	25.962	8	28.32	11 —	21.674	115	74.64	337	49.80	29	62.95	355
Nov. 6.0	14.572	58	47.29	10	26.021	59	28.43	11	21.637	37 —	71.06	358	49.65	15	59.24	371
16.0	14.682	110	47.62	33	26.131	110	28.75	32	21.684	47	67.36	370	49.64	1 —	55.45	379
25.9	14.843	161	48.19	57	26.291	160	29.32	57	21.814	130	63.64	372	49.79	15	51.68	377
Dec. 5.9	15.051	208	49.01	82	26.500	209	30.13	81	22.026	212	59.99	365	50.09	30	48.03	365
15.9	15.302	251	50.05	104	26.751	251	31.18	105	22.320	294	56.53	346	50.52	43	44.62	341
25.9	15.587	285	51.31	126	27.035	284	32.43	125	22.682	362	53.35	318	51.10	58	41.54	308
35.8	15.898	311	52.72	141	27.346	311	33.83	140	23.104	422	50.57	278	51.78	68	38.89	265
Mean Place	12.189		40.19		23.636		21.34		22.965		81.82		55.657		71.37	
Sec δ, Tan δ	1.039		−0.280		1.039		−0.281		1.977		+1.706		3.738		+3.602	
Dψα, Dωα	+0.07		−0.01		+0.07		−0.01		+0.03		+0.08		0.00		+0.18	
Dψδ, Dωδ	−0.3		−0.7		−0.3		−0.7		−0.3		−0.7		−0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ^2 Libræ. Mag. 5.6				Piazzi 221. Mag. 5.8				β Lupi. Mag. 2.8				δ Libræ. Var. 4.8–6.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 14 52		° ′ −11 5		h m 14 52		° ′ +14 46		h m 14 53		° ′ −42 48		h m 14 56		° ′ − 8 11	
	s		″		s		″		s		″		s		″	
Jan. 0.8	22.539	316	1.58	159	23.883	305	14.19	225	13.443	406	23.52	50	38.816	310	55.46	167
10.8	22.855	326	3.17	163	24.188	316	11.94	201	13.849	419	24.02	86	39.126	322	57.13	167
20.8	23.181	327	4.80	160	24.504	321	9.93	172	14.268	421	24.88	115	39.448	323	58.80	159
30.8	23.508	320	6.40	151	24.825	314	8.21	138	14.689	413	26.03	139	39.771	317	60.39	149
Feb. 9.7	23.828	304	7.91	138	25.139	300	6.83	95	15.102	394	27.42	161	40.088	303	61.88	133
19.7	24.132	285	9.29	120	25.439	281	5.88	54	15.496	370	29.03	176	40.391	284	63.21	112
Mar. 1.7	24.417	260	10.49	101	25.720	256	5.34	12	15.866	341	30.79	187	40.675	260	64.33	90
11.7	24.677	234	11.50	78	25.976	229	5.22	29	16.207	307	32.66	193	40.935	234	65.23	66
21.6	24.911	206	12.28	59	26.205	197	5.51	67	16.514	272	34.59	197	41.169	206	65.89	44
31.6	25.117	176	12.87	38	26.402	166	6.18	97	16.786	235	36.56	194	41.375	178	66.33	20
Apr. 10.6	25.293	148	13.25	18	26.568	136	7.15	125	17.021	196	38.50	190	41.553	149	66.53	2
20.5	25.441	118	13.43	3	26.704	104	8.40	144	17.217	158	40.40	184	41.702	120	66.55	16
30.5	25.559	90	13.46	11	26.808	72	9.84	158	17.375	118	42.24	174	41.822	92	66.39	30
May 10.5	25.649	60	13.35	24	26.880	44	11.42	165	17.493	78	43.98	161	41.914	63	66.09	40
20.5	25.709	32	13.11	31	26.924	13	13.07	165	17.571	38	45.59	146	41.977	34	65.69	49
30.4	25.741	5	12.80	39	26.937	16	14.72	160	17.609	2	47.05	128	42.011	7	65.20	54
June 9.4	25.746	25	12.41	45	26.921	42	16.32	151	17.607	42	48.33	107	42.018	22	64.66	58
19.4	25.721	50	11.96	49	26.879	70	17.83	137	17.565	81	49.40	85	41.996	49	64.08	60
29.4	25.671	77	11.47	51	26.809	95	19.20	119	17.484	116	50.25	57	41.947	75	63.48	61
July 9.3	25.594	99	10.96	54	26.714	114	20.39	100	17.368	147	50.82	30	41.872	97	62.87	60
19.3	25.495	120	10.42	54	26.600	133	21.39	77	17.221	176	51.12	2	41.775	119	62.27	58
29.3	25.375	134	9.88	55	26.467	146	22.16	54	17.045	195	51.14	28	41.656	133	61.69	56
Aug. 8.2	25.241	145	9.33	54	26.321	156	22.70	29	16.850	206	50.86	58	41.523	144	61.13	51
18.2	25.096	147	8.79	51	26.165	158	22.99	3	16.644	210	50.28	86	41.379	148	60.62	46
28.2	24.949	143	8.28	47	26.007	153	23.02	26	16.434	203	49.42	112	41.231	144	60.16	39
Sept. 7.2	24.806	131	7.81	40	25.854	142	22.76	52	16.231	183	48.30	133	41.087	133	59.77	30
17.1	24.675	109	7.41	30	25.712	119	22.24	82	16.048	152	46.97	150	40.954	111	59.47	17
27.1	24.566	80	7.11	18	25.593	93	21.42	110	15.896	110	45.47	163	40.843	83	59.30	4
Oct. 7.1	24.486	42	6.93	3	25.500	55	20.32	137	15.786	61	43.84	165	40.760	48	59.26	13
17.1	24.444	2	6.90	18	25.445	13	18.95	165	15.725	1	42.19	162	40.712	4	59.39	33
27.0	24.446	50	7.08	36	25.432	33	17.30	188	15.726	63	40.57	151	40.708	44	59.72	54
Nov. 6.0	24.496	100	7.44	60	25.465	84	15.42	212	15.789	130	39.06	134	40.752	95	60.26	77
16.0	24.596	151	8.04	83	25.549	134	13.30	228	15.919	197	37.72	108	40.847	144	61.03	99
25.9	24.747	198	8.87	104	25.683	181	11.02	241	16.116	256	36.64	77	40.991	192	62.02	121
Dec. 5.9	24.945	241	9.91	126	25.864	225	8.61	246	16.372	310	35.87	44	41.183	233	63.23	138
15.9	25.186	275	11.17	142	26.089	261	6.15	245	16.682	355	35.43	8	41.416	270	64.61	152
25.9	25.461	301	12.59	155	26.350	289	3.70	235	17.037	387	35.35	29	41.686	296	66.13	165
35.8	25.762		14.14		26.639		1.35		17.424		35.64		41.982		67.78	
Mean Place	22.182		0.81		23.753		22.53		13.008		31.36		38.497		53.93	
Sec δ, Tan δ	1.019		−0.196		1.034		+0.264		1.363		−0.926		1.010		−0.144	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		−0.01		+0.06		+0.01		+0.08		−0.04		+0.06		−0.01	
$D_\psi \delta$, $D_\omega \delta$	−0.3		−0.7		−0.3		−0.7		−0.3		−0.7		−0.3		−0.7	

APPARENT PLACES OF STARS, 1919.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Boötis. Mag. 3.6				γ Scorpii. Mag. 3.4				ψ Boötis. Mag. 4.7				c Boötis. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 14 58		° ′ +40 42		h m 14 59		° ′ −24 57		h m 15 0		° ′ +27 15		h m 15 3		° ′ +25 10	
	s		″		s		″		s		″		s		″	
Jan. 0.8	53.289	338	19.52	260	19.908	337	48.43	111	58.366	310	34.77	249	44.509	307	51.29	246
10.8	53.627	360	16.92	216	20.245	350	49.54	126	58.676	327	32.28	214	44.816	323	48.83	214
20.8	53.987	370	14.76	165	20.595	351	50.80	138	59.003	333	30.14	174	45.139	330	46.69	176
30.8	54.357	369	13.11	109	20.946	345	52.18	145	59.336	330	28.40	127	45.469	328	44.93	131
Feb. 9.7	54.726	356	12.02	49	21.291	331	53.63	147	59.666	319	27.13	76	45.797	316	43.62	82
19.7	55.082	336	11.53	11	21.622	309	55.10	145	59.985	299	26.37	25	46.113	297	42.80	32
Mar. 1.7	55.418	306	11.64	68	21.931	287	56.55	139	60.284	275	26.12	27	46.410	274	42.48	18
11.7	55.724	271	12.32	123	22.218	258	57.94	130	60.559	245	26.39	75	46.684	245	42.66	66
21.6	55.995	233	13.55	170	22.476	230	59.24	118	60.804	212	27.14	119	46.929	213	43.32	109
31.6	56.228	190	15.25	210	22.706	200	60.42	107	61.016	178	28.33	156	47.142	181	44.41	145
Apr. 10.6	56.418	147	17.35	239	22.906	169	61.49	95	61.194	144	29.89	185	47.323	145	45.86	176
20.5	56.565	104	19.74	260	23.075	139	62.44	83	61.338	108	31.74	207	47.468	112	47.62	196
30.5	56.669	60	22.34	270	23.214	106	63.27	70	61.446	72	33.81	219	47.580	78	49.58	211
May 10.5	56.729	18	25.04	271	23.320	76	63.97	59	61.518	40	36.00	224	47.658	45	51.69	216
20.5	56.747	22	27.75	263	23.396	45	64.56	46	61.558	5	38.24	221	47.703	11	53.85	213
30.4	56.725	61	30.38	247	23.441	11	65.02	35	61.563	28	40.45	210	47.714	21	55.98	205
June 9.4	56.664	96	32.85	224	23.452	20	65.37	21	61.535	58	42.55	195	47.693	50	58.03	190
19.4	56.568	130	35.09	195	23.432	50	65.58	10	61.477	87	44.50	173	47.643	80	59.93	170
29.4	56.438	160	37.04	160	23.382	80	65.68	3	61.390	114	46.23	148	47.563	108	61.63	146
July 9.3	56.278	184	38.64	122	23.302	107	65.65	18	61.276	136	47.71	118	47.455	129	63.09	117
19.3	56.094	207	39.86	82	23.195	129	65.47	30	61.140	158	48.89	87	47.326	150	64.26	88
29.3	55.887	221	40.68	39	23.066	147	65.17	43	60.982	173	49.76	52	47.176	167	65.14	55
Aug. 8.2	55.666	229	41.07	5	22.919	159	64.74	57	60.809	181	50.28	17	47.009	176	65.69	21
18.2	55.437	231	41.02	48	22.760	164	64.17	69	60.628	185	50.45	19	46.833	180	65.90	14
28.2	55.206	224	40.54	92	22.596	159	63.48	76	60.443	180	50.26	56	46.653	177	65.76	47
Sept. 7.2	54.982	208	39.62	135	22.437	146	62.72	82	60.263	167	49.70	90	46.476	163	65.29	84
17.1	54.774	185	38.27	176	22.291	123	61.90	85	60.096	148	48.80	127	46.313	145	64.45	118
27.1	54.589	150	36.51	214	22.168	92	61.05	84	59.948	118	47.53	162	46.168	116	63.27	152
Oct. 7.1	54.439	109	34.37	249	22.076	50	60.21	77	59.830	81	45.91	193	46.052	79	61.75	182
17.1	54.330	59	31.88	279	22.026	4	59.44	64	59.749	36	43.98	223	45.973	37	59.93	213
27.0	54.271	3	29.09	305	22.022	51	58.80	49	59.713	12	41.75	250	45.936	12	57.80	238
Nov. 6.0	54.268	56	26.04	323	22.073	104	58.31	28	59.725	65	39.25	270	45.948	64	55.42	261
16.0	54.324	115	22.81	334	22.177	158	58.03	5	59.790	118	36.55	285	46.012	117	52.81	276
25.9	54.439	175	19.47	335	22.335	210	57.98	22	59.908	171	33.70	292	46.129	168	50.05	285
Dec. 5.9	54.614	230	16.12	328	22.545	255	58.20	48	60.079	217	30.78	293	46.297	216	47.20	286
15.9	54.844	278	12.84	310	22.800	293	58.68	74	60.296	259	27.85	283	46.513	256	44.34	278
25.9	55.122	317	9.74	282	23.093	321	59.42	96	60.555	292	25.02	264	46.769	288	41.56	262
35.8	55.439		6.92		23.414		60.38		60.847		22.38		47.057		38.94	
Mean Place	53.702		33.88		19.523		51.73		58.475		45.97		44.596		61.84	
Sec δ, Tan δ	1.319		+0.860		1.103		−0.466		1.125		+0.515		1.104		+0.470	
Dψα, Dωα	+0.05		+0.04		+0.07		−0.02		+0.05		+0.02		+0.05		+0.02	
Dψδ, Dωδ	−0.3		−0.7		−0.3		−0.7		−0.3		−0.7		−0.3		−0.7	

Washington Mean Time.	ζ Lupi. Mag. 3.5				ι Libræ. Mag. 4.7				3 Serpentis. Mag. 5.4				γ Triang. Aust. Mag. 3.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 15 6		° ′ −51 47		h m 15 7		° ′ −19 29		h m 15 11		° ′ + 5 14		h m 15 11		° ′ −68 22	
	s		″		s		″		s		″		s		″	
Jan. 0.9	27.718		20.64		36.350		8.21		9.811		16.52		19.43		41.91	
10.8	28.177	459	20.66	2	36.671	321	9.44	123	10.105	294	14.50	202	20.14	71	41.28	63
20.8	28.656	479	21.10	44	37.006	335	10.78	134	10.414	309	12.60	190	20.88	74	41.14	14 —
30.8	29.141	485	21.90	80	37.344	338	12.18	140	10.729	315	10.91	169	21.65	77	41.50	36
Feb. 9.7	29.622	481	23.04	114	37.678	334	13.61	143	11.040	311	9.46	145	22.41	76	42.33	83
19.7	30.086	464	24.48	144	38.000	322	14.99	138	11.340	300	8.33	113	23.15	74	43.59	126
Mar. 1.7	30.526	440	26.17	169	38.303	303	16.29	130	11.624	284	7.53	80	23.86	71	45.24	165
11.7	30.935	409	28.05	188	38.582	279	17.47	118	11.887	263	7.07	46	24.52	66	47.24	200
21.6	31.308	373	30.09	204	38.837	255	18.53	106	12.126	239	6.97	10 —	25.13	61	49.51	227
31.6	31.642	334	32.24	215	39.065	228	19.44	91	12.337	211	7.20	23	25.67	54	52.02	251
Apr. 10.6	31.935	293	34.45	221	39.264	199	20.19	75	12.521	184	7.70	50	26.14	47	54.70	268
20.6	32.180	245	36.69	224	39.434	170	20.80	61	12.676	155	8.46	76	26.54	40	57.49	279
30.5	32.381	201	38.91	222	39.576	142	21.28	48	12.801	125	9.41	95	26.86	32	60.35	286
May 10.5	32.535	154	41.07	216	39.686	110	21.64	36	12.899	98	10.52	111	27.09	23	63.21	286
20.5	32.639	104	43.13	206	39.766	80	21.87	23	12.966	67	11.73	121	27.23	14	66.01	280
30.4	32.693	54	45.06	193	39.817	51	22.01	14	13.005	39	12.98	125	27.28	5 —	68.69	268
June 9.4	32.697	4 —	46.82	176	39.836	19 —	22.05	4 —	13.015	10 —	14.23	125	27.25	3	71.19	250
19.4	32.652	45	48.35	153	39.825	11	22.01	4	12.996	19	15.44	121	27.13	12	73.45	226
29.4	32.558	94	49.63	128	39.784	41	21.87	14	12.949	47	16.57	113	26.93	20	75.41	196
July 9.3	32.419	139	50.63	100	39.713	71	21.65	22	12.874	75	17.62	105	26.65	28	77.02	161
19.3	32.239	180	51.30	67	39.616	97	21.36	29	12.777	97	18.53	91	26.29	36	78.24	122
29.3	32.024	215	51.63	33 —	39.495	121	20.99	37	12.658	119	19.30	77	25.89	40	79.01	77
Aug. 8.3	31.784	240	51.60	3	39.356	139	20.54	45	12.521	137	19.91	61	25.44	45	79.32	31 —
18.2	31.526	258	51.20	40	39.204	152	20.01	53	12.373	148	20.36	45	24.97	47	79.15	17
28.2	31.263	263	50.44	76	39.046	158	19.43	58	12.219	154	20.61	25	24.48	49	78.49	66
Sept. 7.2	31.008	255	49.33	111	38.890	156	18.81	62	12.066	153	20.68	7 —	24.01	47	77.36	113
17.1	30.773	235	47.93	140	38.745	145	18.18	63	11.923	143	20.53	15	23.58	43	75.80	156
27.1	30.573	200	46.24	169	38.622	123	17.57	61	11.798	125	20.17	36	23.21	37	73.84	196
Oct. 7.1	30.418	155	44.38	186	38.526	96	17.00	57	11.698	100	19.58	59	22.92	29	71.57	227
17.1	30.323	95	42.39	199	38.470	56	16.53	47	11.633	65	18.75	83	22.72	20	69.05	252
27.0	30.295	28 —	40.36	203	38.458	12 —	16.18	35	11.609	24 —	17.68	107	22.63	9 —	66.40	265
Nov. 6.0	30.343	48	38.38	198	38.496	38	16.02	16 —	11.632	23	16.38	130	22.66	3	63.71	269
16.0	30.468	125	36.53	185	38.587	91	16.05	3	11.702	70	14.84	154	22.81	15	61.10	261
26.0	30.671	203	34.90	163	38.731	144	16.32	27	11.822	120	13.11	173	23.10	29	58.66	244
Dec. 5.9	30.946	275	33.54	136	38.925	194	16.81	49	11.990	168	11.21	190	23.50	40	56.49	217
15.9	31.285	339	32.54	100	39.165	240	17.55	74	12.202	212	9.19	202	24.00	50	54.67	182
25.9	31.679	394	31.91	63	39.442	277	18.50	95	12.452	250	7.12	207	24.60	60	53.27	140
35.8	32.115	436	31.69	22	39.747	305	19.63	113	12.730	278	5.05	207	25.26	66	52.33	94
Mean Place	27.405		30.31		36.022		10.09		9.668		21.45		19.475		54.18	
Sec δ, Tan δ	1.617		−1.270		1.061		−0.354		1.004		+0.092		2.714		−2.524	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.08		−0.06		+0.07		−0.02		+0.06		0.00		+0.11		−0.11	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		−0.7		−0.3		−0.7		−0.3		−0.7		−0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Boötis. Mag. 3.5				β Libræ. Mag. 2.7				γ Ursæ Minoris. Mag. 3.1				μ Boötis pr. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 15 12		° ′ +33 36		h m 15 12		° ′ − 9 5		h m 15 20		° ′ +72 6		h m 15 21		° ′ +37 39	
	s		″		s		″		s		″		s		″	
Jan. 0.9	13.937		46.52		38.992		6.42		47.45		62.99		25.357		25.82	
10.8	14.249	312	43.91	261	39.297	305	7.99	157	48.05	60	60.34	265	25.671	314	23.13	269
20.8	14.583	334	41.67	224	39.614	317	9.58	159	48.73	68	58.21	213	26.009	338	20.82	231
30.8	14.927	344	39.88	179	39.936	322	11.12	154	49.47	74	56.69	152	26.361	352	18.98	184
Feb. 9.7	15.272	345	38.61	127	40.255	319	12.55	143	50.23	76	55.84	85	26.717	356	17.68	130
19.7	15.608	336	37.87	74	40.562	307	13.83	128	51.00	77	55.66	18	27.064	347	16.95	73
Mar. 1.7	15.927	319	37.71	16	40.853	291	14.91	108	51.74	74	56.18	52	27.397	333	16.81	14
11.7	16.220	293	38.10	39	41.123	270	15.79	88	52.42	68	57.33	115	27.706	309	17.26	45
21.6	16.484	264	39.02	92	41.368	245	16.43	64	53.04	62	59.09	176	27.987	281	18.26	100
31.6	16.716	232	40.40	138	41.588	220	16.86	43	53.57	53	61.36	227	28.233	246	19.75	149
Apr. 10.6	16.911	195	42.19	179	41.781	193	17.06	20	53.99	42	64.05	269	28.443	210	21.65	190
20.6	17.069	158	44.30	211	41.945	164	17.08	2	54.28	29	67.06	301	28.613	170	23.90	225
30.5	17.189	120	46.63	233	42.082	137	16.94	14	54.47	19	70.26	320	28.742	129	26.39	249
May 10.5	17.270	81	49.10	247	42.190	108	16.65	29	54.54	7	73.54	328	28.831	89	29.04	265
20.5	17.315	45	51.62	252	42.269	79	16.27	38	54.48	6	76.80	326	28.881	50	31.73	269
30.4	17.321	6	54.10	248	42.319	50	15.80	47	54.30	18	79.92	312	28.890	9	34.38	265
June 9.4	17.292	29	56.48	238	42.339	20	15.28	52	54.02	28	82.82	290	28.860	30	36.91	253
19.4	17.228	64	58.66	218	42.329	10	14.72	56	53.64	38	85.41	259	28.792	68	39.26	235
29.4	17.133	95	60.60	194	42.291	38	14.14	58	53.18	46	87.63	222	28.689	103	41.36	210
July 9.3	17.007	126	62.25	165	42.224	67	13.56	58	52.63	55	89.41	178	28.555	134	43.14	178
19.3	16.856	151	63.57	132	42.133	91	12.98	58	52.03	60	90.72	131	28.391	164	44.59	145
29.3	16.681	175	64.53	96	42.018	115	12.42	56	51.36	67	91.52	80	28.203	188	45.64	105
Aug. 8.3	16.490	191	65.11	58	41.885	133	11.88	54	50.67	69	91.81	29	27.995	208	46.29	65
18.2	16.288	202	65.29	18	41.739	146	11.38	50	49.97	70	91.57	24	27.775	220	46.52	23
28.2	16.081	207	65.07	22	41.587	152	10.92	46	49.26	71	90.80	77	27.549	226	46.32	20
Sept. 7.2	15.877	204	64.44	63	41.436	151	10.52	40	48.57	69	89.51	129	27.325	224	45.69	63
17.1	15.684	193	63.41	103	41.294	142	10.21	31	47.92	65	87.74	177	27.112	213	44.63	106
27.1	15.513	171	62.00	141	41.172	122	10.01	20	47.32	60	85.51	223	26.918	194	43.16	147
Oct. 7.1	15.370	143	60.21	179	41.075	97	9.93	8	46.79	53	82.86	265	26.755	163	41.31	185
17.1	15.265	105	58.06	215	41.015	60	10.00	7	46.35	44	79.84	302	26.629	126	39.08	223
27.0	15.206	59	55.60	246	40.996	19	10.27	27	46.00	35	76.53	331	26.549	80	36.52	256
Nov. 6.0	15.197	9	52.88	272	41.025	29	10.72	45	45.79	21	72.97	356	26.522	27	33.69	283
16.0	15.244	47	49.95	293	41.104	79	11.40	68	45.69	10	69.26	371	26.551	29	30.62	307
26.0	15.346	102	46.85	310	41.233	129	12.28	88	45.73	4	65.49	377	26.638	87	27.41	321
Dec. 5.9	15.504	158	43.69	316	41.411	178	13.39	111	45.90	17	61.76	373	26.785	147	24.14	327
15.9	15.713	209	40.56	313	41.632	221	14.67	128	46.21	31	58.19	357	26.986	201	20.89	325
25.9	15.969	256	37.55	301	41.891	259	16.10	143	46.65	44	54.87	332	27.236	250	17.77	312
35.8	16.260	291	34.75	280	42.178	287	17.63	153	47.19	54	51.93	294	27.527	291	14.88	289
Mean Place	14.245		58.54		38.743		5.52		50.833		79.86		25.828		38.09	
Sec δ, Tan δ	1.201		+0.665		1.013		−0.160		3.257		+3.100		1.263		+0.772	
$D_\psi\alpha$, $D_\omega\alpha$	+0.05		+0.03		+0.06		−0.01		0.00		+0.13		+0.05		+0.03	
$D_\psi\delta$, $D_\omega\delta$	−0.3		−0.7		−0.3		−0.7		−0.3		−0.8		−0.3		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ^1 Serpentis. Mag. 5.5				ι Draconis. Mag. 3.5				32 Librae. Mag. 5.9				β Coronae Borealis. Mag. 3.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 22		+15 42		15 23		+59 14		15 23		−16 26		15 24		+29 22	
	s		″		s		″		s		″		s		″	
Jan. 0.9	1.852	288	35.96	230	6.110	408	42.09	279	41.350	310	4.77	125	29.089	297	52.74	259
10.8	2.140	307	33.66	208	6.518	453	39.30	229	41.660	324	6.02	133	29.386	319	50.15	227
20.8	2.447	315	31.58	179	6.971	481	37.01	171	41.984	331	7.35	136	29.705	330	47.88	185
30.8	2.762	315	29.79	144	7.452	496	35.30	108	42.315	329	8.71	135	30.035	333	46.03	139
Feb. 9.8	3.077	306	28.35	102	7.948	490	34.22	41	42.644	319	10.06	127	30.368	327	44.64	87
19.7	3.383	292	27.33	60	8.438	474	33.81	— 27	42.963	303	11.33	115	30.695	311	43.77	33
Mar. 1.7	3.675	271	26.73	16	8.912	440	34.08	92	43.266	285	12.48	102	31.006	290	43.44	— 21
11.7	3.946	247	26.57	— 27	9.352	396	35.00	152	43.551	261	13.50	87	31.296	264	43.65	72
21.6	4.193	220	26.84	66	9.748	344	36.52	205	43.812	237	14.37	69	31.560	235	44.37	120
31.6	4.413	193	27.50	100	10.092	283	38.57	250	44.049	209	15.06	54	31.795	201	45.57	159
Apr. 10.6	4.606	162	28.50	131	10.375	218	41.07	282	44.258	183	15.60	39	31.996	168	47.16	192
20.6	4.768	133	29.81	153	10.593	149	43.89	307	44.441	153	15.99	23	32.164	132	49.08	217
30.5	4.901	101	31.34	169	10.742	80	46.96	318	44.594	125	16.22	13	32.296	98	51.25	232
May 10.5	5.002	70	33.03	178	10.822	12	50.14	319	44.719	95	16.35	2	32.394	60	53.57	240
20.5	5.072	40	34.81	180	10.834	— 55	53.33	309	44.814	64	16.37	— 7	32.454	25	55.97	239
30.5	5.112	8	36.61	177	10.779	118	56.42	292	44.878	33	16.30	13	32.479	— 9	58.36	231
June 9.4	5.120	— 22	38.38	166	10.661	177	59.34	264	44.911	3	16.17	21	32.470	44	60.67	214
19.4	5.098	52	40.04	155	10.484	230	61.98	231	44.914	— 30	15.96	26	32.426	76	62.81	196
29.4	5.046	80	41.59	137	10.254	279	64.29	190	44.884	60	15.70	31	32.350	107	64.77	168
July 9.3	4.966	106	42.96	116	9.975	320	66.19	146	44.824	88	15.39	36	32.243	134	66.45	139
19.3	4.860	128	44.12	94	9.655	353	67.65	99	44.736	114	15.03	40	32.109	159	67.84	106
29.3	4.732	147	45.06	68	9.302	376	68.64	49	44.622	134	14.63	44	31.950	178	68.90	71
Aug. 8.3	4.585	161	45.74	42	8.926	391	69.13	— 4	44.488	149	14.19	47	31.772	190	69.61	34
18.2	4.424	168	46.16	14	8.535	396	69.09	53	44.339	158	13.72	50	31.582	198	69.95	— 3
28.2	4.256	168	46.30	— 14	8.139	389	68.56	105	44.181	159	13.22	51	31.384	198	69.92	43
Sept. 7.2	4.088	159	46.16	42	7.750	371	67.51	153	44.022	151	12.71	51	31.186	188	69.49	81
17.2	3.929	143	45.74	73	7.379	339	65.98	200	43.871	133	12.20	47	30.998	170	68.68	118
27.1	3.786	118	45.01	103	7.040	296	63.98	243	43.738	106	11.73	40	30.828	143	67.50	155
Oct. 7.1	3.668	84	43.98	131	6.744	241	61.55	280	43.632	70	11.33	31	30.685	109	65.95	189
17.1	3.584	43	42.67	159	6.503	176	58.75	315	43.562	27	11.02	17	30.576	66	64.06	221
27.0	3.541	— 2	41.08	184	6.327	102	55.60	342	43.535	— 21	10.85	1	30.510	17	61.85	250
Nov. 6.0	3.543	52	39.24	209	6.225	23	52.18	360	43.556	72	10.84	— 19	30.493	— 36	59.35	272
16.0	3.595	103	37.15	227	6.202	— 64	48.58	371	43.628	125	11.03	39	30.529	90	56.63	289
26.0	3.698	152	34.88	241	6.266	148	44.87	370	43.753	175	11.42	62	30.619	145	53.74	300
Dec. 5.9	3.850	198	32.47	248	6.414	231	41.17	360	43.928	221	12.04	83	30.764	195	50.74	301
15.9	4.048	238	29.99	248	6.645	306	37.57	338	44.149	261	12.87	102	30.959	239	47.73	293
25.9	4.286	271	27.51	242	6.951	373	34.19	304	44.410	291	13.89	119	31.198	276	44.80	275
35.9	4.557		25.09		7.324		31.15		44.701		15.08		31.474		42.05	
Mean Place	1.883		43.20		7.660		57.64		41.112		6.06		29.370		63.08	
Sec δ, Tan δ	1.039		+0.281		1.956		+1.680		1.043		−0.295		1.148		+0.563	
$D_\psi a$, $D_\omega a$	+0.06		+0.01		+0.03		+0.07		+0.07		−0.01		+0.05		+0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.3		−0.8		−0.3		−0.8		−0.3		−0.8		−0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν¹ Boötis. Mag. 5.2				γ Lupi (*mean*). Mag. 3.0				γ Libræ. Mag. 4.0				α Coronæ Borealis. Mag. 2.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 28		+41 6		15 29		−40 53		15 30		−14 31		15 31		+26 58	
	s		″		s		″		s		″		s		″	
Jan. 0.9	0.574	316	18.18	278	44.438	376	37.36	21	59.759	302	11.66	128	15.205	290	61.97	258
10.8	0.890	345	15.40	237	44.814	398	37.57	49	60.061	319	12.94	135	15.495	312	59.39	227
20.8	1.235	361	13.03	187	45.212	406	38.06	77	60.380	326	14.29	136	15.807	325	57.12	190
30.8	1.596	367	11.16	133	45.618	407	38.83	100	60.706	325	15.65	131	16.132	328	55.22	144
Feb. 9.8	1.963	362	9.83	74	46.025	396	39.83	120	61.031	317	16.96	121	16.460	322	53.78	93
19.7	2.325	347	9.09	13	46.421	381	41.03	135	61.348	303	18.17	110	16.782	309	52.85	41
Mar. 1.7	2.672	326	8.96	49	46.802	357	42.38	146	61.651	285	19.27	94	17.091	290	52.44	10
11.7	2.998	295	9.45	104	47.159	332	43.84	154	61.936	263	20.21	76	17.381	265	52.54	61
21.7	3.293	261	10.49	156	47.491	303	45.38	158	62.199	240	20.97	59	17.646	237	53.15	108
31.6	3.554	222	12.05	200	47.794	271	46.96	161	62.439	214	21.56	41	17.883	206	54.23	148
Apr. 10.6	3.776	181	14.05	234	48.065	236	48.57	159	62.653	187	21.97	24	18.089	174	55.71	180
20.6	3.957	141	16.39	261	48.301	202	50.16	156	62.840	159	22.21	11	18.263	141	57.51	207
30.5	4.098	96	19.00	276	48.503	163	51.72	151	62.999	130	22.32	1	18.404	105	59.58	222
May 10.5	4.194	52	21.76	281	48.666	124	53.23	144	63.129	102	22.31	11	18.509	71	61.80	231
20.5	4.246	10	24.57	279	48.790	84	54.67	134	63.231	70	22.20	19	18.580	35	64.11	232
30.5	4.256	32	27.36	265	48.874	43	56.01	121	63.301	40	22.01	27	18.615	2	66.43	225
June 9.4	4.224	72	30.01	247	48.917	1	57.22	108	63.341	7	21.74	31	18.617	33	68.68	211
19.4	4.152	109	32.48	220	48.918	42	58.30	90	63.348	25	21.43	35	18.584	65	70.79	193
29.4	4.043	144	34.68	189	48.876	81	59.20	70	63.323	54	21.08	38	18.519	96	72.72	168
July 9.4	3.899	175	36.57	152	48.795	120	59.90	48	63.269	85	20.70	41	18.423	125	74.40	141
19.3	3.724	203	38.09	112	48.675	153	60.38	24	63.184	110	20.29	43	18.298	149	75.81	110
29.3	3.521	222	39.21	69	48.522	179	60.62	1	63.074	132	19.86	45	18.149	170	76.91	75
Aug. 8.3	3.299	237	39.90	26	48.343	199	60.61	30	62.942	148	19.41	47	17.979	184	77.66	42
18.2	3.062	244	40.16	19	48.144	211	60.31	54	62.794	158	18.94	48	17.795	192	78.08	5
28.2	2.818	242	39.97	63	47.933	210	59.77	81	62.636	159	18.46	46	17.603	193	78.13	33
Sept. 7.2	2.576	233	39.34	109	47.723	200	58.96	102	62.477	153	18.00	44	17.410	186	77.80	70
17.2	2.343	212	38.25	151	47.523	175	57.94	123	62.324	136	17.56	39	17.224	168	77.10	106
27.1	2.131	183	36.74	191	47.348	144	56.71	136	62.188	110	17.17	31	17.056	143	76.04	141
Oct. 7.1	1.948	144	34.83	230	47.204	98	55.35	144	62.078	76	16.86	20	16.913	110	74.63	177
17.1	1.804	97	32.53	265	47.106	43	53.91	147	62.002	34	16.66	7	16.803	68	72.86	208
27.1	1.707	42	29.88	292	47.063	17	52.44	142	61.968	13	16.59	10	16.735	20	70.78	236
Nov. 6.0	1.665	16	26.96	316	47.080	81	51.02	130	61.981	64	16.69	30	16.715	32	68.42	261
16.0	1.681	76	23.80	331	47.161	148	49.72	111	62.045	116	16.99	50	16.747	85	65.81	278
26.0	1.757	139	20.49	338	47.309	208	48.61	89	62.161	166	17.49	71	16.832	138	63.03	290
Dec. 5.9	1.896	195	17.11	335	47.517	266	47.72	60	62.327	213	18.20	90	16.970	188	60.13	293
15.9	2.091	247	13.76	321	47.783	315	47.12	30	62.540	252	19.10	108	17.158	232	57.20	287
25.9	2.338	292	10.55	297	48.098	354	46.82	0	62.792	282	20.18	123	17.390	270	54.33	272
35.9	2.630		7.58		48.452		46.82		63.074		21.41		17.660		51.61	
Mean Place	1.192		30.63		44.205		44.58		59.562		12.57		15.471		71.37	
Sec δ, Tan δ	1.327		+0.872		1.323		−0.866		1.033		−0.259		1.122		+0.508	
$D_\psi a$, $D_\omega a$	+0.04		+0.04		+0.08		−0.04		+0.07		−0.01		+0.05		+0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.2		−0.8		−0.2		−0.8		−0.2		−0.8		−0.2		−0.8	

APPARENT PLACES OF STARS, 1919.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Cor. Bor. *seq.* Mag. 5.1				α Serpentis. Mag. 2.8				β Serpentis. Mag. 3.7				κ Serpentis. Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 36		+36 53		15 40		+ 6 40		15 42		+15 40		15 45		+18 23	
	s		″		s		″		s		″		s		″	
Jan. 0.9	19.137		42.10		16.605		42.43		26.827		21.67		5.387		20.17	
10.9	19.437	300	39.33	277	16.883	278	40.39	204	27.102	275	19.35	232	5.661	274	17.77	240
20.8	19.764	327	36.94	239	17.179	296	38.48	191	27.398	296	17.24	211	5.957	296	15.60	217
30.8	20.108	344	34.99	195	17.488	309	36.78	170	27.708	310	15.40	184	6.267	310	13.72	188
Feb. 9.8	20.458	350	33.57	142	17.797	309	35.33	145	28.020	312	13.92	148	6.581	314	12.22	150
19.7	20.806	348	32.71	86	18.100	303	34.20	113	28.327	307	12.83	109	6.891	310	11.14	108
Mar. 1.7	21.141	335	32.44	27 —	18.393	293	33.43	77	28.625	298	12.18	65	7.190	299	10.52	62
11.7	21.455	314	32.75	31	18.669	276	33.00	43	28.905	280	11.97	21 —	7.474	284	10.36	16 —
21.7	21.744	289	33.62	87	18.925	256	32.95	5 —	29.164	259	12.20	23	7.736	262	10.66	30
31.6	22.001	257	35.00	138	19.158	233	33.25	30	29.400	236	12.83	63	7.975	239	11.39	73
Apr. 10.6	22.223	222	36.83	183	19.364	206	33.86	61	29.609	209	13.82	99	8.187	212	12.49	110
20.6	22.410	187	39.02	219	19.545	181	34.73	87	29.791	182	15.13	131	8.371	184	13.91	142
30.6	22.557	147	41.46	244	19.698	153	35.83	110	29.943	152	16.67	154	8.524	153	15.60	169
May 10.5	22.663	106	44.09	263	19.822	124	37.08	125	30.064	121	18.40	173	8.646	122	17.45	185
20.5	22.730	67	46.79	270	19.917	95	38.43	135	30.155	91	20.22	182	8.738	92	19.41	196
30.5	22.757	27 —	49.49	270	19.981	64	39.84	141	30.213	58	22.09	187	8.796	58	21.41	200
June 9.4	22.744	13	52.08	259	20.014	33	41.26	142	30.239	26 —	23.93	184	8.821	25 —	23.38	197
19.4	22.694	50	54.51	243	20.017	3 —	42.63	137	30.234	5	25.69	176	8.814	7	25.27	189
29.4	22.606	88	56.71	220	19.988	29	43.93	130	30.196	38	27.33	164	8.774	40	27.01	174
July 9.4	22.483	123	58.62	191	19.929	59	45.10	117	30.127	69	28.81	148	8.703	71	28.57	156
19.3	22.330	153	60.18	156	19.843	86	46.14	104	30.031	96	30.07	126	8.603	100	29.92	135
29.3	22.150	180	61.38	120	19.730	113	47.03	89	29.907	124	31.11	104	8.476	127	31.01	109
Aug. 8.3	21.947	203	62.18	80	19.597	133	47.74	71	29.763	144	31.90	79	8.327	149	31.83	82
18.3	21.729	218	62.56	38 —	19.446	151	48.27	53	29.602	161	32.44	54	8.161	166	32.38	55
28.2	21.502	227	62.51	5	19.286	160	48.59	32	29.430	172	32.69	25 —	7.985	176	32.62	24 —
Sept. 7.2	21.275	227	62.05	46	19.123	163	48.71	12 —	29.256	174	32.66	3	7.805	180	32.55	7
17.2	21.055	220	61.15	90	18.964	159	48.60	11	29.088	168	32.32	34	7.630	175	32.16	39
27.1	20.854	201	59.83	132	18.820	144	48.26	34	28.932	156	31.69	63	7.470	160	31.46	70
Oct. 7.1	20.679	175	58.11	172	18.699	121	47.69	57	28.799	133	30.77	92	7.331	139	30.43	103
17.1	20.539	140	56.01	210	18.608	91	46.87	82	28.698	101	29.54	123	7.224	107	29.11	132
27.1	20.444	95	53.56	245	18.556	52	45.79	108	28.636	62	28.03	151	7.155	69	27.48	163
Nov. 6.0	20.401	43 —	50.83	273	18.549	7 —	44.49	130	28.618	18 —	26.25	178	7.132	23 —	25.58	190
16.0	20.412	11	47.84	299	18.590	41	42.95	154	28.649	31	24.23	202	7.158	26	23.42	216
26.0	20.482	70	44.69	315	18.681	91	41.21	174	28.731	82	22.01	222	7.234	76	21.08	234
Dec. 6.0	20.610	128	41.45	324	18.821	140	39.30	191	28.863	132	19.64	237	7.362	128	18.58	250
15.9	20.793	183	38.21	324	19.007	186	37.27	203	29.043	180	17.18	246	7.537	175	15.99	259
25.9	21.027	234	35.06	315	19.233	226	35.18	209	29.264	221	14.70	248	7.755	218	13.42	257
35.9	21.304	277	32.12	294	19.492	259	33.10	208	29.520	256	12.29	241	8.010	255	10.92	250
Mean Place	19.671		53.18		16.608		46.62		26.951		27.91		5.563		26.88	
Sec δ, Tan δ	1.250		+0.751		1.007		+0.117		1.039		+0.281		1.054		+0.332	
$D_\psi\alpha$, $D_\omega\alpha$	+0.04		+0.03		+0.06		0.00		+0.05		+0.01		+0.05		+0.01	
$D_\psi\delta$, $D_\omega\delta$	−0.2		−0.8		−0.2		−0.8		−0.2		−0.8		−0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Serpentis. Mag. 3.6				12 H. Draconis. Mag. 5.1				ε Serpentis. Mag. 3.8				ζ Ursae Minoris. Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 15 45		° ′ − 3 10		h m 15 45		° ′ +62 50		h m 15 46		° ′ + 4 43		h m 15 46		° ′ +78 2	
	s		″		s		″		s		″		s		″	
Jan. 0.9	23.530	280	61.28	167	23.57	41	44.35	294	46.593	274	11.51	196	49.14	75	24.67	280
10.9	23.810	298	62.95	162	23.98	46	41.41	248	46.867	294	9.55	185	49.89	89	21.87	231
20.8	24.108	310	64.57	153	24.44	51	38.93	191	47.161	307	7.70	167	50.78	99	19.56	174
30.8	24.418	312	66.10	137	24.95	53	37.02	129	47.468	308	6.03	143	51.77	107	17.82	111
Feb. 9.8	24.730	305	67.47	115	25.48	54	35.73	63	47.776	304	4.60	114	52.84	109	16.71	42
19.7	25.035	296	68.62	91	26.02	53	35.10	6	48.080	294	3.46	80	53.93	108	16.29	24
Mar. 1.7	25.331	280	69.53	63	26.55	51	35.16	72	48.374	278	2.66	47	55.01	103	16.53	91
11.7	25.611	260	70.16	35	27.06	46	35.88	135	48.652	258	2.19	10	56.04	95	17.44	153
21.7	25.871	239	70.51	9	27.52	41	37.23	193	48.910	238	2.09	22	56.99	82	18.97	207
31.6	26.110	214	70.60	17	27.93	33	39.16	240	49.148	212	2.31	52	57.81	69	21.04	253
Apr. 10.6	26.324	190	70.43	38	28.26	28	41.56	277	49.360	187	2.83	79	58.50	53	23.57	288
20.6	26.514	162	70.05	57	28.54	20	44.33	307	49.547	159	3.62	100	59.03	35	26.45	314
30.6	26.676	136	69.48	72	28.74	13	47.40	322	49.706	132	4.62	117	59.38	16	29.59	327
May 10.5	26.812	105	68.76	82	28.87	4	50.62	328	49.838	102	5.79	126	59.54	2	32.86	329
20.5	26.917	76	67.94	88	28.91	3	53.90	322	49.940	72	7.05	133	59.52	20	36.15	321
30.5	26.993	46	67.06	91	28.88	10	57.12	307	50.012	41	8.38	133	59.32	37	39.36	302
June 9.4	27.039	13	66.15	91	28.78	19	60.19	285	50.053	9	9.71	132	58.95	52	42.38	278
19.4	27.052	18	65.24	89	28.59	24	63.04	252	50.062	23	11.03	123	58.43	68	45.16	242
29.4	27.034	48	64.35	84	28.35	30	65.56	214	50.039	52	12.26	113	57.75	80	47.58	202
July 9.4	26.986	79	63.51	77	28.05	36	67.70	171	49.987	82	13.39	102	56.95	91	49.60	158
19.3	26.907	104	62.74	69	27.69	39	69.41	125	49.905	109	14.41	87	56.04	99	51.18	110
29.3	26.803	129	62.05	60	27.30	43	70.66	75	49.796	131	15.28	71	55.05	105	52.28	59
Aug. 8.3	26.674	145	61.45	51	26.87	45	71.41	24	49.665	148	15.99	54	54.00	110	52.87	6
18.3	26.529	156	60.94	40	26.42	47	71.65	28	49.517	160	16.53	36	52.90	111	52.93	45
28.2	26.373	161	60.54	28	25.95	46	71.37	80	49.357	164	16.89	16	51.79	110	52.48	98
Sept. 7.2	26.212	156	60.26	14	25.49	45	70.57	130	49.193	159	17.05	4	50.69	106	51.50	147
17.2	26.056	143	60.12	0	25.04	41	69.27	179	49.034	147	17.01	26	49.63	100	50.03	194
27.1	25.913	120	60.12	17	24.63	38	67.48	225	48.887	124	16.75	47	48.63	91	48.09	237
Oct. 7.1	25.793	90	60.29	35	24.25	32	65.23	266	48.763	95	16.28	72	47.72	79	45.72	277
17.1	25.703	51	60.64	53	23.93	26	62.57	303	48.668	55	15.56	94	46.93	65	42.95	312
27.1	25.652	6	61.17	75	23.67	17	59.54	332	48.613	12	14.62	119	46.28	50	39.83	338
Nov. 6.0	25.646	43	61.92	95	23.50	8	56.22	356	48.601	36	13.43	140	45.78	31	36.45	358
16.0	25.689	93	62.87	117	23.42	1	52.66	369	48.637	86	12.03	162	45.47	12	32.87	368
26.0	25.782	143	64.04	133	23.43	10	48.97	373	48.723	135	10.41	179	45.35	8	29.19	370
Dec. 6.0	25.925	187	65.37	150	23.53	19	45.24	366	48.858	181	8.62	191	45.43	29	25.49	358
15.9	26.112	228	66.87	161	23.72	28	41.58	348	49.039	222	6.71	199	45.72	47	21.91	339
25.9	26.340	261	68.48	167	24.00	37	38.10	320	49.261	255	4.72	199	46.19	66	18.52	305
35.9	26.601		70.15		24.37		34.90		49.516		2.73		46.85		15.47	
Mean Place	23.463		59.66		25.684		58.31		46.602		14.98		55.296		39.38	
Sec δ, Tan δ	1.002		−0.056		2.191		+1.950		1.003		+0.083		4.827		+4.722	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		0.00		+0.02		+0.07		+0.06		0.00		−0.04		+0.17	
$D_\psi\delta$, $D_\omega\delta$	−0.2		−0.8		−0.2		−0.8		−0.2		−0.8		−0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Triang. Aust. Mag. 3.0				λ Libræ. Mag. 5.1				γ Serpentis. Mag. 3.9				π Scorpii. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 15 47		° ′ −63 10		h m 15 48		° ′ −19 55		h m 15 52		° ′ +15 55		h m 15 53		° ′ −25 52	
	s		″		s		″		s		″		s		″	
Jan. 0.9	59.31		44.83		37.851		31.39		42.477		24.75		57.028		51.29	
10.9	59.87	56	43.92	91	38.152	301	32.34	95	42.745	268	22.38	237	57.338	310	51.95	66
20.8	60.47	60	43.44	48	38.471	319	33.41	107	43.037	292	20.22	216	57.668	330	52.76	81
30.8	61.10	63	43.39	5 —	38.802	331	34.54	113	43.343	306	18.33	189	58.011	343	53.69	93
Feb. 9.8	61.73	63	43.76	37	39.136	334	35.68	114	43.654	311	16.78	155	58.357	346	54.69	100
19.7	62.37	64	44.53	77	39.464	328	36.80	112	43.962	308	15.64	114	58.700	343	55.73	104
Mar. 1.7	62.98	61	45.67	114	39.781	317	37.85	105	44.261	299	14.93	71	59.032	332	56.78	105
11.7	63.57	59	47.12	145	40.081	300	38.80	95	44.546	285	14.66	27 —	59.348	316	57.79	101
21.7	64.13	56	48.87	175	40.363	282	39.63	83	44.810	264	14.83	17	59.645	297	58.74	95
31.6	64.64	51	50.85	198	40.622	259	40.33	70	45.053	243	15.42	59	59.920	275	59.63	89
Apr. 10.6	65.10	46	53.03	218	40.858	236	40.91	58	45.270	217	16.37	95	60.170	250	60.43	80
20.6	65.50	40	55.36	233	41.067	209	41.37	46	45.461	191	17.65	128	60.394	224	61.14	71
30.6	65.85	35	57.80	244	41.249	182	41.71	34	45.622	161	19.18	153	60.590	196	61.78	64
May 10.5	66.13	28	60.29	249	41.402	153	41.96	25	45.754	132	20.90	174	60.755	165	62.35	57
20.5	66.34	21	62.78	249	41.525	123	42.11	15	45.854	100	22.72	182	60.890	135	62.84	49
30.5	66.47	13	65.23	245	41.617	92	42.19	8	45.922	68	24.60	188	60.991	101	63.27	43
June 9.4	66.53	6 —	67.58	235	41.674	57	42.22	3 —	45.959	37	26.46	186	61.057	66	63.63	36
19.4	66.52	1	69.77	219	41.698	24 —	42.19	3	45.962	3 —	28.25	179	61.087	30 —	63.92	29
29.4	66.44	8	71.75	198	41.687	11	42.10	9	45.931	31	29.91	166	61.080	7	64.12	20
July 9.4	66.28	16	73.46	171	41.644	43	41.95	15	45.869	62	31.41	150	61.038	42	64.26	14
19.3	66.05	23	74.84	138	41.567	77	41.74	21	45.778	91	32.71	130	60.961	77	64.29	3 —
29.3	65.76	29	75.87	103	41.460	107	41.48	26	45.660	118	33.77	106	60.851	110	64.22	7
Aug. 8.3	65.43	33	76.49	62	41.329	131	41.17	31	45.518	142	34.58	81	60.715	136	64.04	18
18.3	65.06	37	76.68	19 —	41.178	151	40.79	38	45.357	161	35.14	56	60.556	159	63.75	29
28.2	64.68	38	76.43	25	41.013	165	40.36	43	45.185	172	35.40	26 —	60.384	172	63.35	40
Sept. 7.2	64.28	40	75.74	69	40.844	169	39.88	48	45.008	177	35.38	2	60.206	178	62.84	51
17.2	63.91	37	74.62	112	40.680	164	39.37	51	44.834	174	35.06	32	60.031	175	62.24	60
27.1	63.56	35	73.11	151	40.528	152	38.85	52	44.674	160	34.44	62	59.872	159	61.57	67
Oct. 7.1	63.27	29	71.26	185	40.403	125	38.35	50	44.534	140	33.52	92	59.736	136	60.85	72
17.1	63.06	21	69.12	214	40.309	94	37.90	45	44.425	109	32.29	123	59.635	101	60.15	70
27.1	62.92	14	66.80	232	40.258	51	37.54	36	44.353	72	30.78	151	59.577	58	59.49	66
Nov. 6.0	62.88	4 —	64.38	242	40.255	3 —	37.32	22	44.325	28 —	29.00	178	59.569	8 —	58.91	58
16.0	62.94	6	61.95	243	40.305	50	37.24	8 —	44.346	21	26.96	204	59.616	47	58.47	44
26.0	63.11	17	59.61	234	40.407	102	37.36	12	44.417	71	24.73	223	59.717	101	58.20	27
Dec. 6.0	63.38	27	57.46	215	40.562	155	37.66	30	44.539	122	22.34	239	59.873	156	58.11	9 —
15.9	63.74	36	55.57	189	40.766	204	38.16	50	44.710	171	19.85	249	60.081	208	58.24	13
25.9	64.19	45	54.02	155	41.011	245	38.87	71	44.922	212	17.34	251	60.333	252	58.58	34
35.9	64.70	51	52.86	116	41.291	280	39.74	87	45.170	248	14.89	245	60.620	287	59.11	53
Mean Place	59.525		55.58		37.706		33.86		42.646		30.52		56.891		55.16	
Sec δ, Tan δ	2.217		−1.978		1.064		−0.363		1.040		+0.285		1.111		−0.485	
Dψα, Dωα	+0.10		−0.07		+0.07		−0.01		+0.05		+0.01		+0.07		−0.02	
Dψδ, Dωδ	−0.2		−0.8		−0.2		−0.8		−0.2		−0.8		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Coronæ Borealis. Mag. 4.2				δ Scorpii. Mag. 2.5				θ Draconis. Mag. 4.1				β Scorpii. Mag. 2.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 54		+27 6		15 55		−22 23		16 0		+58 46		16 0		−19 35	
	s		″		s		″		s		″		s		″	
Jan. 0.9	13.595		33.84		32.540		28.89		20.398		40.23		43.503		2.48	
10.9	13.868	273	31.20	264	32.841	301	29.69	80	20.749	351	37.18	305	43.795	292	3.38	90
20.8	14.167	299	28.83	237	33.162	321	30.62	93	21.156	407	34.57	261	44.109	314	4.38	100
30.8	14.482	315	26.84	199	33.496	334	31.63	101	21.603	447	32.47	210	44.434	325	5.43	105
Feb. 9.8	14.805	323	25.28	156	33.833	337	32.68	105	22.074	471	30.98	149	44.765	331	6.50	107
19.8	15.127	322	24.22	106	34.167	334	33.74	106	22.556	482	30.15	83	45.093	328	7.54	104
Mar. 1.7	15.441	314	23.68	54	34.491	324	34.75	101	23.032	476	29.98	17	45.412	319	8.50	96
11.7	15.738	297	23.68	0	34.799	308	35.70	95	23.489	457	30.50	— 52	45.716	304	9.37	87
21.7	16.017	279	24.19	51	35.090	291	36.55	85	23.916	427	31.64	114	46.003	287	10.11	74
31.6	16.269	252	25.18	99	35.359	269	37.30	75	24.299	383	33.38	174	46.270	267	10.74	63
Apr. 10.6	16.495	226	26.59	141	35.604	245	37.94	64	24.632	333	35.62	224	46.515	245	11.24	50
20.6	16.690	195	28.37	178	35.823	219	38.48	54	24.905	273	38.28	266	46.734	219	11.61	37
30.6	16.853	163	30.44	207	36.016	193	38.93	45	25.117	212	41.25	297	46.928	194	11.88	27
May 10.5	16.981	128	32.69	225	36.179	163	39.29	36	25.261	144	44.42	317	47.092	164	12.06	18
20.5	17.076	95	35.06	237	36.312	133	39.58	29	25.339	78	47.68	326	47.227	135	12.15	9
30.5	17.134	58	37.46	240	36.412	100	39.78	20	25.349	10	50.94	326	47.330	103	12.19	4
June 9.5	17.157	23	39.82	236	36.477	65	39.94	16	25.292	— 57	54.09	315	47.399	69	12.17	— 2
19.4	17.143	— 14	42.07	225	36.507	30	40.04	10	25.171	121	57.03	294	47.434	35	12.11	6
29.4	17.095	48	44.14	207	36.503	— 4	40.07	3	24.990	181	59.69	266	47.434	0	12.00	11
July 9.4	17.012	83	45.99	185	36.462	41	40.04	— 3	24.753	237	62.02	233	47.397	37	11.85	15
19.3	16.898	114	47.57	158	36.388	74	39.95	9	24.466	287	63.94	192	47.327	70	11.66	19
29.3	16.756	142	48.84	127	36.282	106	39.78	17	24.137	329	65.42	148	47.228	99	11.41	25
Aug. 8.3	16.589	167	49.79	95	36.151	131	39.52	26	23.773	364	66.42	100	47.099	129	11.11	30
18.3	16.405	184	50.38	59	35.998	153	39.20	32	23.384	389	66.93	51	46.950	149	10.77	34
28.2	16.208	197	50.61	23	35.829	169	38.79	41	22.980	404	66.91	— 2	46.785	165	10.38	39
Sept. 7.2	16.007	201	50.46	— 15	35.656	173	38.31	48	22.572	408	66.39	52	46.614	171	9.94	44
17.2	15.810	197	49.93	53	35.486	170	37.78	53	22.174	398	65.35	104	46.446	168	9.48	46
27.2	15.625	185	49.04	89	35.330	156	37.21	57	21.796	378	63.83	152	46.290	156	9.00	48
Oct. 7.1	15.464	161	47.77	127	35.198	132	36.64	57	21.453	343	61.84	199	46.156	134	8.54	46
17.1	15.333	131	46.14	163	35.098	100	36.09	55	21.156	297	59.41	243	46.054	102	8.13	41
27.1	15.242	91	44.18	196	35.040	58	35.61	48	20.919	237	56.60	281	45.993	61	7.80	33
Nov. 6.0	15.197	45	41.92	226	35.031	9	35.23	38	20.748	171	53.44	316	45.978	15	7.59	21
16.0	15.202	— 5	39.40	252	35.074	— 43	35.01	22	20.656	92	50.03	341	46.014	— 36	7.52	7
26.0	15.261	59	36.67	273	35.172	98	34.94	7	20.646	10	46.43	360	46.104	90	7.62	— 10
Dec. 6.0	15.373	112	33.81	286	35.322	150	35.07	— 13	20.720	— 74	42.75	368	46.247	143	7.91	29
15.9	15.537	164	30.88	293	35.522	200	35.41	34	20.879	159	39.10	365	46.438	191	8.38	47
25.9	15.747	210	27.99	289	35.766	244	35.93	52	21.119	240	35.59	351	46.672	234	9.05	67
35.9	15.996	249	25.21	278	36.045	279	36.64	71	21.430	311	32.32	327	46.942	270	9.87	82
Mean Place	13.973		41.85		32.417		31.98		22.222		52.48		43.408		5.00	
Sec δ, Tan δ	1.123		+0.512		1.082		−0.412		1.929		+1.650		1.061		−0.356	
Dψα, Dωα	+0.05		+0.02		+0.07		−0.01		+0.02		+0.06		+0.07		−0.01	
Dψδ, Dωδ	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**κ Herculis.** Mag. 5.3				**Groombridge 2320.** Mag. 5.4				**φ Herculis.** Mag. 4.3				**δ¹ Apodis.** Mag. 4.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	16 4		+17 15		16 6		+68 1		16 6		+45 8		16 8		−78 29	
	s		″		s		″		s		″		s		″	
Jan. 0.9	24.810		36.57		2.70		11.56		12.054		37.96		9.52		27.72	
10.9	25.070	260	34.19	238	3.13	43	8.50	306	12.343	289	34.96	300	10.62	110	26.00	172
20.8	25.356	286	32.00	219	3.64	51	5.88	262	12.670	327	32.33	263	11.82	120	24.74	126
30.8	25.658	302	30.11	189	4.21	57	3.80	208	13.026	356	30.16	217	13.11	129	23.97	77
Feb. 9.8	25.965	307	28.56	155	4.82	61	2.33	147	13.398	372	28.52	164	14.45	134	23.71	26 —
19.8	26.273	308	27.43	113	5.46	64	1.53	80	13.775	377	27.49	103	15.81	136	23.94	23
Mar. 1.7	26.574	301	26.73	70	6.09	63	1.40	13 —	14.147	372	27.09	40 —	17.16	135	24.65	71
11.7	26.862	288	26.49	24 —	6.70	61	1.95	55	14.505	358	27.31	22	18.47	131	25.80	115
21.7	27.133	271	26.71	22	7.27	57	3.16	121	14.841	336	28.15	84	19.71	124	27.36	156
31.6	27.383	250	27.35	64	7.79	52	4.95	179	15.147	306	29.57	142	20.87	116	29.28	192
Apr. 10.6	27.610	227	28.40	105	8.23	44	7.26	231	15.419	272	31.48	191	21.92	105	31.53	225
20.6	27.809	199	29.76	136	8.60	37	9.99	273	15.651	232	33.80	232	22.85	93	34.03	250
30.6	27.981	172	31.40	164	8.87	27	13.03	304	15.840	189	36.45	265	23.64	79	36.74	271
May 10.5	28.123	142	33.23	183	9.04	17	16.27	324	15.984	144	39.32	287	24.28	64	39.61	287
20.5	28.233	110	35.18	195	9.13	9 —	19.59	332	16.080	96	42.32	300	24.77	49	42.56	295
30.5	28.311	78	37.19	201	9.11	2	22.92	333	16.129	49	45.35	303	25.08	31	45.54	298
June 9.5	28.355	44	39.19	200	9.00	11	26.12	320	16.131	2 —	48.31	296	25.20	12 —	48.47	293
19.4	28.365	10 —	41.11	192	8.80	20	29.10	298	16.086	45	51.12	281	25.16	4	51.28	281
29.4	28.342	23	42.92	181	8.51	29	31.82	272	15.995	91	53.69	257	24.94	22	53.89	261
July 9.4	28.285	57	44.55	163	8.15	36	34.18	236	15.861	134	55.98	229	24.55	39	56.25	236
19.3	28.197	88	45.98	143	7.71	44	36.12	194	15.688	173	57.91	193	24.00	55	58.27	202
29.3	28.079	118	47.17	119	7.22	49	37.60	148	15.480	208	59.45	154	23.31	69	59.89	162
Aug. 8.3	27.937	142	48.10	93	6.69	53	38.60	100	15.244	236	60.56	111	22.51	80	61.07	118
18.3	27.774	163	48.75	65	6.12	57	39.08	48 —	14.984	260	61.22	66	21.61	90	61.75	68
28.2	27.598	176	49.12	37	5.53	59	39.05	3	14.709	275	61.41	19 —	20.66	95	61.90	15 —
Sept. 7.2	27.416	182	49.17	5 —	4.93	60	38.49	56	14.429	280	61.13	28	19.69	97	61.51	39
17.2	27.235	181	48.93	24	4.35	58	37.40	109	14.152	277	60.38	75	18.75	94	60.58	93
27.2	27.065	170	48.37	56	3.80	55	35.83	157	13.890	262	59.16	122	17.88	87	59.14	144
Oct. 7.1	26.916	149	47.48	89	3.29	51	33.77	206	13.652	238	57.49	167	17.11	77	57.22	192
17.1	26.795	121	46.30	118	2.84	45	31.28	249	13.450	202	55.40	209	16.47	64	54.91	231
27.1	26.710	85	44.81	149	2.47	37	28.39	289	13.292	158	52.91	249	16.02	45	52.27	264
Nov. 6.0	26.669	41 —	43.05	176	2.19	28	25.17	322	13.187	105	50.10	281	15.76	26	49.41	286
16.0	26.676	7	41.02	203	2.00	19	21.69	348	13.142	45 —	47.00	310	15.71	5 —	46.42	299
26.0	26.734	58	38.79	223	1.93	7 —	18.06	363	13.160	18	43.68	332	15.90	19	43.43	299
Dec. 6.0	26.842	108	36.39	240	1.98	5	14.34	372	13.242	82	40.25	343	16.30	40	40.55	288
15.9	26.999	157	33.89	250	2.14	16	10.63	371	13.390	148	36.79	346	16.93	63	37.88	267
25.9	27.199	200	31.37	252	2.40	26	7.09	354	13.596	206	33.41	338	17.75	82	35.50	238
35.9	27.438	239	28.91	246	2.78	38	3.80	329	13.856	260	30.22	319	18.74	99	33.52	198
Mean Place	25.048		42.02		5.780		23.98		13.044		48.10		11.449		39.35	
Sec δ, Tan δ	1.047		+0.310		2.672		+2.478		1.418		+1.005		5.014		−4.913	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		+0.01		0.00		+0.08		+0.04		+0.03		+0.18		−0.16	
$D_\psi \delta$, $D_\omega \delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

Washington Mean Time.	δ Ophiuchi. Mag. 3.0				σ Cor. Bor. *seq.* Mag. 5.8				19 Ursæ Minoris. Mag. 5.5				γ² Normæ. Mag. 4.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	16 10		− 3 29		16 11		+34 3		16 12		+76 4		16 13		−49 57	
	s		″		s		″		s		″		s		″	
Jan. 0.9	5.916	264	12.82	159	38.055	265	39.93	285	61.36	58	43.03	303	46.061	391	21.12	65
10.9	6.180	287	14.41	155	38.320	296	37.08	254	61.94	71	40.00	260	46.452	426	20.47	32
20.8	6.467	300	15.96	145	38.616	318	34.54	215	62.65	82	37.40	206	46.878	449	20.15	3
30.8	6.767	308	17.41	131	38.934	331	32.39	167	63.47	89	35.34	146	47.327	461	20.12	— 29
Feb. 9.8	7.075	305	18.72	109	39.265	335	30.72	114	64.36	94	33.88	81	47.788	462	20.41	56
19.8	7.380	300	19.81	86	39.600	331	29.58	58	65.30	95	33.07	13	48.250	454	20.97	82
Mar. 1.7	7.680	288	20.67	58	39.931	319	29.00	— 2	66.25	92	32.94	— 56	48.704	439	21.79	104
11.7	7.968	272	21.25	31	40.250	299	29.02	57	67.17	87	33.50	119	49.143	419	22.83	123
21.7	8.240	253	21.56	5	40.549	277	29.59	111	68.04	78	34.69	178	49.562	393	24.06	138
31.7	8.493	233	21.61	— 22	40.826	248	30.70	158	68.82	68	36.47	229	49.955	362	25.44	151
Apr. 10.6	8.726	209	21.39	43	41.074	217	32.28	198	69.50	54	38.76	272	50.317	329	26.95	162
20.6	8.935	186	20.96	61	41.291	183	34.26	230	70.04	41	41.48	303	50.646	291	28.57	170
30.6	9.121	157	20.35	77	41.474	146	36.56	253	70.45	25	44.51	322	50.937	248	30.27	173
May 10.5	9.278	129	19.58	87	41.620	108	39.09	266	70.70	9	47.73	333	51.185	203	32.00	176
20.5	9.407	100	18.71	93	41.728	69	41.75	272	70.79	— 5	51.06	331	51.388	155	33.76	173
30.5	9.507	67	17.78	96	41.797	29	44.47	268	70.74	21	54.37	320	51.543	102	35.49	169
June 9.5	9.574	35	16.82	96	41.826	— 11	47.15	255	70.53	36	57.57	299	51.645	50	37.18	158
19.4	9.609	2	15.86	92	41.815	50	49.70	238	70.17	49	60.56	270	51.695	— 6	38.76	147
29.4	9.611	— 33	14.94	86	41.765	88	52.08	213	69.68	61	63.26	237	51.689	59	40.23	129
July 9.4	9.578	65	14.08	80	41.677	123	54.21	184	69.07	72	65.63	194	51.630	111	41.52	107
19.4	9.513	94	13.28	71	41.554	157	56.05	150	68.35	81	67.57	149	51.519	159	42.59	81
29.3	9.419	121	12.57	62	41.397	183	57.55	113	67.54	88	69.06	101	51.360	200	43.40	55
Aug. 8.3	9.298	142	11.95	52	41.214	206	58.68	74	66.66	93	70.07	50	51.160	232	43.95	22
18.3	9.156	158	11.43	41	41.008	221	59.42	33	65.73	96	70.57	— 3	50.928	257	44.17	— 11
28.2	8.998	166	11.02	28	40.787	228	59.75	— 9	64.77	96	70.54	54	50.671	267	44.06	43
Sept. 7.2	8.832	163	10.74	17	40.559	226	59.66	51	63.81	95	70.00	105	50.404	263	43.63	77
17.2	8.669	156	10.57	2	40.333	215	59.15	92	62.86	91	68.95	156	50.141	248	42.86	107
27.2	8.513	136	10.55	— 13	40.118	195	58.23	134	61.95	84	67.39	202	49.893	216	41.79	133
Oct. 7.1	8.377	107	10.68	32	39.923	164	56.89	174	61.11	75	65.37	245	49.677	173	40.46	155
17.1	8.270	71	11.00	48	39.759	125	55.15	211	60.36	65	62.92	284	49.504	116	38.91	172
27.1	8.199	28	11.48	68	39.634	78	53.04	244	59.71	52	60.08	317	49.388	49	37.19	180
Nov. 6.1	8.171	— 19	12.16	87	39.556	26	50.60	271	59.19	35	56.91	343	49.339	— 22	35.39	180
16.0	8.190	69	13.03	107	39.530	— 30	47.89	293	58.84	20	53.48	360	49.361	98	33.59	174
26.0	8.259	119	14.10	126	39.560	86	44.96	311	58.64	3	49.88	367	49.459	170	31.85	159
Dec. 6.0	8.378	165	15.36	140	39.646	142	41.85	316	58.61	— 16	46.21	366	49.629	243	30.26	139
15.9	8.543	208	16.76	152	39.788	193	38.69	312	58.77	32	42.55	350	49.872	306	28.87	112
25.9	8.751	242	18.28	157	39.981	238	35.57	298	59.09	49	39.05	325	50.178	359	27.75	84
35.9	8.993		19.85		40.219		32.59		59.58		35.80		50.537		26.91	
Mean Place	5.940		12.00		38.680		47.99		66.928		55.08		46.140		29.34	
Sec δ, Tan δ	1.002		−0.061		1.207		+0.676		4.158		+4.035		1.554		−1.190	
D_ψα, D_ωα	+0.06		0.00		+0.05		+0.02		−0.03		+0.12		+0.09		−0.04	
D_ψδ, D_ωδ	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−[illegible]	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Ophiuchi. Mag. 3.3				σ Scorpii. Mag. 3.1				τ Herculis. Mag. 3.9				γ Herculis. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 16 14		° ′ − 4 29		h m 16 16		° ′ −25 23		h m 16 17		° ′ +46 29		h m 16 18		° ′ +19 20	
	s		″		s		″		s		″		s		″	
Jan. 0.9	1.983	263	46.15	153	15.752	293	54.62	51	17.249	281	70.75	307	20.442	250	27.66	245
10.9	2.246	285	47.68	149	16.045	317	55.13	67	17.530	323	67.68	272	20.692	277	25.21	226
20.8	2.531	300	49.17	141	16.362	333	55.80	76	17.853	354	64.96	226	20.969	295	22.95	196
30.8	2.831	308	50.58	127	16.695	340	56.56	84	18.207	373	62.70	173	21.264	307	20.99	159
Feb. 9.8	3.139	307	51.85	107	17.035	341	57.40	86	18.580	382	60.97	113	21.571	308	19.40	119
19.8	3.446	300	52.92	85	17.376	334	58.26	86	18.962	380	59.84	48	21.879	304	18.21	72
Mar. 1.7	3.746	289	53.77	58	17.710	322	59.12	83	19.342	370	59.36 —	14	22.183	294	17.49	25
11.7	4.035	275	54.35	32	18.032	306	59.95	78	19.712	348	59.50	77	22.477	279	17.24 —	23
21.7	4.310	257	54.67	7	18.338	289	60.73	70	20.060	321	60.27	136	22.756	259	17.47	68
31.7	4.567	236	54.74 —	19	18.627	266	61.43	64	20.381	287	61.63	187	23.015	237	18.15	109
Apr. 10.6	4.803	213	54.55	40	18.893	243	62.07	56	20.668	247	63.50	232	23.252	212	19.24	143
20.6	5.016	191	54.15	58	19.136	215	62.63	50	20.915	205	65.82	266	23.464	184	20.67	173
30.6	5.207	161	53.57	73	19.351	189	63.13	44	21.120	159	68.48	289	23.648	154	22.40	194
May 10.5	5.368	134	52.84	83	19.540	157	63.57	38	21.279	111	71.37	305	23.802	123	24.34	208
20.5	5.502	104	52.01	89	19.697	123	63.95	33	21.390	62	74.42	309	23.925	90	26.42	214
30.5	5.606	72	51.12	91	19.820	90	64.28	29	21.452	13	77.51	303	24.015	55	28.56	214
June 9.5	5.678	39	50.21	92	19.910	51	64.57	25	21.465 —	38	80.54	290	24.070	20	30.70	207
19.4	5.717	5	49.29	89	19.961	13	64.82	18	21.427	84	83.44	267	24.090 —	16	32.77	195
29.4	5.722 —	29	48.40	83	19.974 —	24	65.00	14	21.343	131	86.11	240	24.074	50	34.72	178
July 9.4	5.693	61	47.57	78	19.950	63	65.14	7	21.212	172	88.51	205	24.024	84	36.50	156
19.4	5.632	92	46.79	69	19.887	96	65.21 —	1	21.040	209	90.56	167	23.940	115	38.06	132
29.3	5.540	120	46.10	61	19.791	128	65.20	10	20.831	242	92.23	124	23.825	141	39.38	105
Aug. 8.3	5.420	141	45.49	52	19.663	152	65.10	21	20.589	268	93.47	78	23.684	165	40.43	75
18.3	5.279	156	44.97	41	19.511	172	64.89	30	20.321	284	94.25	32	23.519	180	41.18	44
28.2	5.123	167	44.56	30	19.339	181	64.59	40	20.037	292	94.57 —	16	23.339	188	41.62	13
Sept. 7.2	4.956	165	44.26	18	19.158	181	64.19	48	19.745	291	94.41	65	23.151	189	41.75 —	21
17.2	4.791	156	44.08	5	18.977	170	63.71	56	19.454	278	93.76	112	22.962	180	41.54	53
27.2	4.635	138	44.03 —	9	18.807	150	63.15	61	19.176	255	92.64	158	22.782	161	41.01	87
Oct. 7.1	4.497	109	44.12	26	18.657	118	62.54	62	18.921	220	91.06	202	22.621	136	40.14	119
17.1	4.388	74	44.38	42	18.539	78	61.92	60	18.701	177	89.04	242	22.485	99	38.95	151
27.1	4.314	31	44.80	61	18.461	31	61.32	54	18.524	125	86.62	277	22.386	57	37.44	180
Nov. 6.1	4.283 —	17	45.41	81	18.430 —	22	60.78	44	18.399	64	83.85	308	22.329	9	35.64	207
16.0	4.300	66	46.22	99	18.452	78	60.34	29	18.335	0	80.77	330	22.320 —	41	33.57	228
26.0	4.366	115	47.21	118	18.530	132	60.05	13	18.335	65	77.47	344	22.361	93	31.29	246
Dec. 6.0	4.481	163	48.39	133	18.662	184	59.92 —	5	18.400	130	74.03	349	22.454	143	28.83	258
15.9	4.644	206	49.72	144	18.846	231	59.97	24	18.530	194	70.54	343	22.597	186	26.25	259
25.9	4.850	240	51.16	150	19.077	269	60.21	42	18.724	249	67.11	325	22.783	227	23.66	253
35.9	5.090		52.66		19.346		60.63		18.973		63.86		23.010		21.13	
Mean Place	2.014		45.65		15.705		58.44		18.362		80.14		20.767		32.74	
Sec δ, Tan δ	1.003		−0.079		1.107		−0.475		1.453		+1.054		1.060		+0.351	
Dψα, Dωα	+0.06		0.00		+0.07		−0.01		+0.04		+0.03		+0.05		+0.01	
Dψδ, Dωδ	*−0.2*		*−0.9*		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Ursæ Minoris. Mag. 5.0				γ Apodis. Mag. 3.9				ω Herculis. Mag. 4.5				η Draconis. Mag. 2.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	16 19		+75 56		16 20		−78 42		16 21		+14 12		16 22		+61 41	
	s		″		s		″		s		″		s		″	
Jan. 0.9	45.58	55	21.76	307	56.64	107	53.25	189	40.115	248	64.04	227	51.22	34	39.74	319
10.9	46.13	68	18.69	264	57.71	119	51.36	144	40.363	273	61.77	211	51.56	40	36.55	280
20.9	46.81	79	16.05	214	58.90	129	49.92	97	40.636	291	59.66	187	51.96	45	33.75	230
30.8	47.60	88	13.91	154	60.19	135	48.95	48	40.927	300	57.79	155	52.41	50	31.45	172
Feb. 9.8	48.48	93	12.37	88	61.54	139	48.47	—3	41.227	304	56.24	118	52.91	51	29.73	108
19.8	49.41	93	11.49	22	62.93	138	48.50	49	41.531	300	55.06	77	53.42	52	28.65	40
Mar. 1.7	50.34	92	11.27	—47	64.31	135	48.99	93	41.831	291	54.29	33	53.94	49	28.25	—28
11.7	51.26	86	11.74	111	65.66	129	49.92	136	42.122	276	53.96	—10	54.43	48	28.53	95
21.7	52.12	79	12.85	170	66.95	122	51.28	174	42.398	256	54.06	52	54.91	44	29.48	154
31.7	52.91	69	14.55	223	68.17	111	53.02	208	42.654	237	54.58	89	55.35	39	31.02	210
Apr. 10.6	53.60	57	16.78	267	69.28	100	55.10	236	42.891	213	55.47	123	55.74	33	33.12	255
20.6	54.17	41	19.45	300	70.28	87	57.46	260	43.104	187	56.70	149	56.07	27	35.67	290
30.6	54.58	28	22.45	321	71.15	71	60.06	278	43.291	158	58.19	171	56.34	19	38.57	316
May 10.6	54.86	13	25.66	333	71.86	54	62.84	289	43.449	129	59.90	184	56.53	12	41.73	330
20.5	54.99	—4	28.99	334	72.40	38	65.73	295	43.578	97	61.74	191	56.65	5	45.03	333
30.5	54.95	18	32.33	324	72.78	19	68.68	292	43.675	62	63.65	191	56.70	—4	48.36	327
June 9.5	54.77	33	35.57	304	72.97	1	71.60	285	43.737	29	65.56	187	56.66	10	51.63	310
19.4	54.44	46	38.61	279	72.98	—17	74.45	267	43.766	—4	67.43	176	56.56	18	54.73	286
29.4	53.98	60	41.40	242	72.81	36	77.12	245	43.762	40	69.19	162	56.38	24	57.59	255
July 9.4	53.38	69	43.82	204	72.45	51	79.57	212	43.722	74	70.81	144	56.14	30	60.14	217
19.4	52.69	79	45.86	159	71.94	67	81.69	176	43.648	104	72.25	121	55.84	35	62.31	174
29.3	51.90	86	47.45	111	71.27	80	83.45	132	43.544	132	73.46	99	55.49	39	64.05	128
Aug. 8.3	51.04	92	48.56	61	70.47	90	84.77	84	43.412	154	74.45	72	55.10	43	65.33	79
18.3	50.12	96	49.17	9	69.57	95	85.61	32	43.258	172	75.17	46	54.67	45	66.12	27
28.3	49.16	96	49.26	—43	68.62	99	85.93	—23	43.086	180	75.63	18	54.22	46	66.39	—24
Sept. 7.2	48.20	94	48.83	95	67.63	98	85.70	76	42.906	181	75.81	—11	53.76	45	66.15	77
17.2	47.26	91	47.88	144	66.65	93	84.94	129	42.725	174	75.70	39	53.31	45	65.38	127
27.2	46.35	85	46.44	192	65.72	83	83.65	178	42.551	156	75.31	70	52.86	40	64.11	176
Oct. 7.1	45.50	77	44.52	236	64.89	68	81.87	221	42.395	129	74.61	98	52.46	37	62.35	223
17.1	44.73	66	42.16	276	64.21	53	79.66	256	42.266	96	73.63	128	52.09	31	60.12	265
27.1	44.07	53	39.40	310	63.68	32	77.10	281	42.170	53	72.35	156	51.78	23	57.47	301
Nov. 6.1	43.54	38	36.30	336	63.36	11	74.29	297	42.117	6	70.79	180	51.55	16	54.46	330
16.0	43.16	23	32.94	357	63.25	—13	71.32	300	42.111	—43	68.99	203	51.39	6	51.16	355
26.0	42.93	5	29.37	365	63.38	35	68.32	294	42.154	93	66.96	220	51.33	—2	47.61	366
Dec. 6.0	42.88	—12	25.72	365	63.73	58	65.38	276	42.247	142	64.76	232	51.35	12	43.95	368
15.9	43.00	29	22.07	351	64.31	78	62.62	249	42.389	186	62.44	236	51.47	20	40.27	359
25.9	43.29	47	18.56	329	65.09	95	60.13	213	42.575	225	60.08	235	51.67	29	36.68	339
35.9	43.76		15.27		66.04		58.00		42.800		57.73		51.96		33.29	
Mean Place	51.167		33.09		58.848		64.41		40.369		67.98		53.507		50.09	
Sec δ, Tan δ	4.117		+3.993		5.112		−5.014		1.032		+0.253		2.109		+1.857	
$D_\psi \alpha$, $D_\omega \alpha$	−0.03		+0.11		+0.18		−0.14		+0.05		+0.01		+0.02		+0.05	
$D_\psi \delta$, $D_\omega \delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Scorpii. (*Antares.*) Mag. 1.2				β Herculis. Mag. 2.8				λ Ophiuchi. Mag. 3.8				A Draconis. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 16 24		° ′ −26 15		h m 16 26		° ′ +21 39		h m 16 26		° ′ + 2 9		h m 16 28		° ′ +68 56	
	s		″		s		″		s		″		s		″	
Jan. 0.9	26.287	288	8.08	41	43.791	244	49.58	253	49.476	247	35.48	178	4.60	39	26.02	320
10.9	26.575	315	8.49	56	44.035	271	47.05	233	49.723	272	33.70	171	4.99	49	22.82	280
20.9	26.890	331	9.05	68	44.306	293	44.72	203	49.995	290	31.99	156	5.48	55	20.02	230
30.8	27.221	341	9.73	75	44.599	306	42.69	165	50.285	299	30.43	137	6.03	61	17.72	172
Feb. 9.8	27.562	342	10.48	79	44.905	309	41.04	122	50.584	301	29.06	110	6.64	65	16.00	108
19.8	27.904	337	11.27	79	45.214	306	39.82	75	50.885	298	27.96	80	7.29	66	14.92	39
Mar. 1.7	28.241	327	12.06	76	45.520	298	39.07	25	51.183	289	27.16	49	7.95	64	14.53	— 28
11.7	28.568	313	12.82	72	45.818	285	38.82	— 25	51.472	276	26.67	16	8.59	62	14.81	96
21.7	28.881	295	13.54	67	46.103	265	39.07	71	51.748	259	26.51	— 17	9.21	57	15.77	157
31.7	29.176	275	14.21	61	46.368	245	39.78	115	52.007	240	26.68	46	9.78	50	17.34	211
Apr. 10.6	29.451	251	14.82	55	46.613	219	40.93	151	52.247	218	27.14	73	10.28	42	19.45	258
20.6	29.702	226	15.37	50	46.832	192	42.44	182	52.465	195	27.87	94	10.70	32	22.03	294
30.6	29.928	197	15.87	44	47.024	162	44.26	204	52.660	169	28.81	111	11.02	24	24.97	318
May 10.6	30.125	166	16.31	40	47.186	129	46.30	219	52.829	141	29.92	123	11.26	14	28.15	333
20.5	30.291	133	16.71	36	47.315	97	48.49	227	52.970	110	31.15	130	11.40	4	31.48	337
30.5	30.424	98	17.07	33	47.412	61	50.76	227	53.080	78	32.45	132	11.44	— 7	34.85	330
June 9.5	30.522	60	17.40	28	47.473	24	53.03	220	53.158	46	33.77	130	11.37	16	38.15	314
19.4	30.582	21	17.68	24	47.497	— 13	55.23	207	53.204	10	35.07	124	11.21	27	41.29	291
29.4	30.603	— 19	17.92	18	47.484	47	57.30	190	53.214	— 24	36.31	115	10.94	34	44.20	257
July 9.4	30.584	58	18.10	12	47.437	83	59.20	167	53.190	57	37.46	104	10.60	43	46.77	220
19.4	30.526	93	18.22	5	47.354	116	60.87	142	53.133	89	38.50	92	10.17	49	48.97	177
29.3	30.433	125	18.27	— 5	47.238	143	62.29	113	53.044	118	39.42	76	9.68	54	50.74	130
Aug. 8.3	30.308	152	18.22	15	47.095	167	63.42	82	52.926	140	40.18	61	9.14	59	52.04	80
18.3	30.156	173	18.07	26	46.928	185	64.24	50	52.786	159	40.79	45	8.55	62	52.84	28
28.3	29.983	182	17.81	36	46.743	194	64.74	16	52.627	169	41.24	27	7.93	63	53.12	— 23
Sept. 7.2	29.801	185	17.45	46	46.549	196	64.90	— 19	52.458	171	41.51	9	7.30	63	52.89	76
17.2	29.616	175	16.99	54	46.353	188	64.71	54	52.287	163	41.60	— 9	6.67	60	52.13	127
27.2	29.441	155	16.45	60	46.165	171	64.17	88	52.124	148	41.51	29	6.07	57	50.86	177
Oct. 7.1	29.286	125	15.85	64	45.994	145	63.29	123	51.976	121	41.22	51	5.50	52	49.09	223
17.1	29.161	86	15.21	62	45.849	110	62.06	155	51.855	88	40.71	73	4.98	44	46.86	265
27.1	29.075	38	14.59	58	45.739	69	60.51	186	51.767	48	39.98	94	4.54	35	44.21	302
Nov. 6.1	29.037	— 14	14.01	49	45.670	21	58.65	214	51.719	— 1	39.04	115	4.19	24	41.19	332
16.0	29.051	69	13.52	36	45.649	— 30	56.51	237	51.720	48	37.89	135	3.95	15	37.87	355
26.0	29.120	124	13.16	20	45.679	81	54.14	256	51.768	98	36.54	153	3.80	2	34.32	367
Dec. 6.0	29.244	177	12.96	4	45.760	132	51.58	265	51.866	146	35.01	168	3.78	— 10	30.65	370
16.0	29.421	224	12.92	— 14	45.892	179	48.93	268	52.012	187	33.33	176	3.88	21	26.95	360
25.9	29.645	264	13.06	33	46.071	219	46.25	262	52.199	226	31.57	180	4.09	34	23.35	339
35.9	29.909		13.39		46.290		43.63		52.425		29.77		4.43		19.96	
Mean Place	26.272		12.06		44.186		54.58		49.602		36.92		8.068		36.27	
Sec δ, Tan δ	1.115		−0.493		1.076		+0.397		1.001		+0.038		2.783		+2.598	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		−0.01		+0.05		+0.01		+0.06		0.00		0.00		+0.07	
$D_\psi \delta$, $D_\omega \delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

Washington Mean Time.	τ Scorpii. Mag. 2.9				σ Herculis. Mag. 4.2				ζ Ophiuchi. Mag. 2.7				24 Scorpii. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 16 30		° ′ −28 2		h m 16 31		° ′ +42 35		h m 16 32		° ′ −10 24		h m 16 36		° ′ −17 35	
	s		″		s		″		s		″		s		″	
Jan. 0.9	50.195		52.63		28.482		64.03		41.742		13.44		53.116		8.58	
		287		28		257		307		255		118		262		78
10.9	50.482		52.91		28.739		60.96		41.997		14.62		53.378		9.36	
		315		43		298		275		280		119		287		85
20.9	50.797		53.34		29.037		58.21		42.277		15.81		53.665		10.21	
		333		55		327		234		298		115		307		89
30.8	51.130		53.89		29.364		55.87		42.575		16.96		53.972		11.10	
		344		65		350		183		308		107		317		88
Feb. 9.8	51.474		54.54		29.714		54.04		42.883		18.03		54.289		11.98	
		346		71		360		127		310		95		320		82
19.8	51.820		55.25		30.074		52.77		43.193		18.98		54.609		12.80	
		342		73		361		66		306		78		317		73
Mar. 1.7	52.162		55.98		30.435		52.11		43.499		19.76		54.926		13.53	
		334		73		352		2		299		59		310		62
11.7	52.496		56.71		30.787		52.09	—	43.798		20.35		55.236		14.15	
		320		70		338		58		287		39		298		49
21.7	52.816		57.41		31.125		52.67		44.085		20.74		55.534		14.64	
		302		67		314		117		272		17		283		36
31.7	53.118		58.08		31.439		53.84		44.357		20.91	—	55.817		15.00	
		284		63		287		170		252		2		265		21
Apr. 10.6	53.402		58.71		31.726		55.54		44.609		20.89		56.082		15.21	
		260		58		252		214		233		20		245		10
20.6	53.662		59.29		31.978		57.68		44.842		20.69		56.327		15.31	—
		235		55		214		252		210		35		221		1
30.6	53.897		59.84		32.192		60.20		45.052		20.34		56.548		15.30	
		206		51		173		277		184		46		196		9
May 10.6	54.103		60.35		32.365		62.97		45.236		19.88		56.744		15.21	
		175		47		130		295		156		54		167		15
20.5	54.278		60.82		32.495		65.92		45.392		19.34		56.911		15.06	
		143		44		84		302		126		61		137		20
30.5	54.421		61.26		32.579		68.94		45.518		18.73		57.048		14.86	
		105		42		38		299		94		63		103		23
June 9.5	54.526		61.68		32.617	—	71.93		45.612		18.10		57.151		14.63	
		67		37		9		289		59		64		68		24
19.4	54.593		62.05		32.608		74.82		45.671		17.46		57.219		14.39	
		27		34		55		272		23		62		30		24
29.4	54.620	—	62.39		32.553		77.54		45.694	—	16.84		57.249	—	14.15	
		14		29		100		245		13		59		8		24
July 9.4	54.606		62.68		32.453		79.99		45.681		16.25		57.241		13.91	
		53		21		140		214		47		56		43		25
19.4	54.553		62.89		32.313		82.13		45.634		15.69		57.198		13.66	
		90		13		180		178		82		52		80		25
29.3	54.463		63.02		32.133		83.91		45.552		15.17		57.118		13.41	
		125		3		214		139		112		47		112		26
Aug. 8.3	54.338		63.05	—	31.919		85.30		45.440		14.70		57.006		13.15	
		152		9		240		96		137		42		139		27
18.3	54.186		62.96		31.679		86.26		45.303		14.28		56.867		12.88	
		175		20		260		51		156		37		160		30
28.3	54.011		62.76		31.419		86.77		45.147		13.91		56.707		12.58	
		187		32		270		4		169		32		173		31
Sept. 7.2	53.824		62.44		31.149		86.81	—	44.978		13.59		56.534		12.27	
		189		44		272		43		171		25		176		32
17.2	53.635		62.00		30.877		86.38		44.807		13.34		56.358		11.95	
		181		55		262		89		163		19		169		32
27.2	53.454		61.45		30.615		85.49		44.644		13.15		56.189		11.63	
		162		63		245		135		148		10		154		30
Oct. 7.1	53.292		60.82		30.370		84.14		44.496		13.05		56.035		11.33	
		131		67		213		179		122		0		126		27
17.1	53.161		60.15		30.157		82.35		44.374		13.05		55.909		11.06	
		94		69		174		220		87		13		93		19
27.1	53.067		59.46		29.983		80.15		44.287		13.18		55.816		10.87	
		45		67		126		257		45		28		49		11
Nov. 6.1	53.022	—	58.79		29.857		77.58		44.242	—	13.46		55.767	—	10.76	—
		7		60		70		288		2		43		1		1
16.0	53.029		58.19		29.787		74.70		44.244		13.89		55.768		10.77	
		63		48		11		314		52		59		52		14
26.0	53.092		57.71		29.776	—	71.56		44.296		14.48		55.820		10.91	
		119		35		53		330		102		76		103		30
Dec. 6.0	53.211		57.36		29.829		68.26		44.398		15.24		55.923		11.21	
		174		17		113		338		150		92		154		45
16.0	53.385		57.19		29.942		64.88		44.548		16.16		56.077		11.66	
		221		0		172		336		195		103		199		60
25.9	53.606		57.19		30.114		61.52		44.743		17.19		56.276		12.26	
		262		18		226		322		231		115		238		74
35.9	53.868		57.37		30.340		58.30		44.974		18.34		56.514		13.00	
Mean Place	50.202		56.93		29.483		71.75		41.797		14.54		53.153		11.04	
Sec δ, Tan δ	1.133		−0.533		1.359		+0.920		1.017		−0.184		1.049		−0.317	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.07		−0.01		+0.04		+0.02		+0.07		0.00		+0.07		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.2		−0.9		−0.2		−0.9		−0.1		−0.9		−0.1		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Herculis. Mag. 3.0				α Triang. Aust. Mag. 1.9				η Herculis. Mag. 3.6				Groombridge 2377. Mag. 4.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	16 38		+31 44		16 40		−68 52		16 40		+39 4		16 43		+56 55	
	s		″		s		″		s		″		s		″	
Jan. 0.9	13.280		49.89		3.44		41.63		6.199		25.30		43.699		26.58	
10.9	13.516	236	47.05	284	4.03	59	39.88	175	6.442	243	22.27	303	43.978	279	23.29	329
20.9	13.788	272	44.47	258	4.69	66	38.50	138	6.723	281	19.53	274	44.316	338	20.35	294
30.8	14.085	297	42.23	224	5.41	72	37.53	97	7.035	312	17.16	237	44.704	388	17.86	249
Feb. 9.8	14.399	314	40.43	180	6.17	76	36.98	55	7.367	332	15.28	188	45.127	423	15.90	196
19.8	14.722	323	39.13	130	6.94	77	36.84 —	14	7.711	344	13.94	134	45.575	448	14.57	133
Mar. 1.8	15.046	324	38.37	76	7.72	78	37.12	28	8.058	347	13.19	75	46.031	456	13.88	69
11.7	15.364	318	38.18 —	19	8.49	77	37.79	67	8.399	341	13.04 —	15	46.483	452	13.87 —	1
21.7	15.668	304	38.55	37	9.23	74	38.82	103	8.726	327	13.51	47	46.919	436	14.52	65
31.7	15.955	287	39.46	91	9.94	71	40.17	135	9.033	307	14.55	104	47.326	407	15.80	128
Apr. 10.6	16.218	263	40.87	141	10.60	66	41.83	166	9.316	283	16.11	156	47.697	371	17.65	185
20.6	16.455	237	42.70	183	11.21	61	43.74	191	9.568	252	18.12	201	48.023	326	20.00	235
30.6	16.661	206	44.88	218	11.74	53	45.89	215	9.786	218	20.50	238	48.295	272	22.74	274
May 10.6	16.834	173	47.32	244	12.21	47	48.20	231	9.966	180	23.16	266	48.510	215	25.78	304
20.5	16.972	138	49.94	262	12.59	38	50.64	244	10.107	141	26.00	284	48.663	153	29.01	323
30.5	17.072	100	52.65	271	12.88	29	53.15	251	10.205	98	28.94	294	48.751	88	32.33	332
June 9.5	17.132	60	55.36	271	13.08	20	55.67	252	10.259	54	31.87	293	48.775 —	24	35.63	330
19.5	17.152 —	20	58.00	264	13.16	8	58.15	248	10.268 —	9	34.72	285	48.732	43	38.82	319
29.4	17.131	21	60.48	248	13.16	0	60.53	238	10.233	35	37.41	269	48.627	105	41.82	300
July 9.4	17.070	61	62.76	228	13.05	11	62.71	218	10.154	79	39.85	244	48.462	165	44.54	272
19.4	16.972	98	64.77	201	12.85	20	64.66	195	10.033	121	42.01	216	48.239	223	46.94	240
29.3	16.837	135	66.48	171	12.56	29	66.31	165	9.875	158	43.83	182	47.966	273	48.94	200
Aug. 8.3	16.671	166	67.85	137	12.18	38	67.59	128	9.683	192	45.28	145	47.649	317	50.50	156
18.3	16.479	192	68.84	99	11.74	44	68.46	87	9.464	219	46.31	103	47.296	353	51.59	109
28.3	16.266	213	69.44	60	11.26	48	68.88 —	42	9.223	241	46.92	61	46.918	378	52.20	61
Sept. 7.2	16.043	223	69.63 —	19	10.75	51	68.83	5	8.971	252	47.08 —	16	46.525	393	52.29 —	9
17.2	15.816	227	69.41	22	10.23	52	68.30	53	8.715	256	46.79	29	46.128	397	51.87	42
27.2	15.595	221	68.78	63	9.73	50	67.29	101	8.466	249	46.04	75	45.740	388	50.93	94
Oct. 7.2	15.391	204	67.73	105	9.27	46	65.84	145	8.233	233	44.85	119	45.375	365	49.49	144
17.1	15.213	178	66.30	143	8.89	38	64.00	184	8.029	204	43.22	163	45.045	330	47.58	191
27.1	15.069	144	64.48	182	8.59	30	61.82	218	7.861	168	41.18	204	44.763	282	45.23	235
Nov. 6.1	14.969	100	62.31	217	8.40	19	59.39	243	7.739	122	38.79	239	44.539	224	42.47	276
16.0	14.918 —	51	59.83	248	8.32 —	8	56.79	260	7.669	70	36.06	273	44.383	156	39.37	310
26.0	14.921	3	57.10	273	8.37	5	54.14	265	7.656 —	13	33.06	300	44.305 —	78	36.01	336
Dec. 6.0	14.979	58	54.19	291	8.56	19	51.54	260	7.703	47	29.88	318	44.306	1	32.45	356
16.0	15.091	112	51.16	303	8.87	31	49.07	247	7.808	105	26.61	327	44.386	80	28.82	363
25.9	15.254	163	48.13	303	9.28	41	46.81	226	7.969	161	23.33	328	44.546	160	25.23	359
35.9	15.464	210	45.17	296	9.82	54	44.85	196	8.181	212	20.18	315	44.781	235	21.79	344
Mean Place	13.941		55.66		4.408		51.28		7.096		31.88		45.621		34.54	
Sec δ, Tan δ	1.176		+0.619		2.776		−2.589		1.288		+0.812		1.832		+1.536	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		+0.01		+0.13		−0.06		+0.04		+0.02		+0.02		+0.03	
$D_\psi \delta$, $D_\omega \delta$	−0.1		−0.9		−0.1		−0.9		−0.1		−0.9		−0.1		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Scorpii. Mag. 2.4				49 Herculis. Mag. 6.4				ε¹ Aræ. Mag. 4.2				κ Ophiuchi. Mag. 3.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	16 44		−34 8		16 48		+15 6		16 53		−53 2		16 53		+ 9 29	
	s		″		s		″		s		″		s		″	
Jan. 0.9	54.713		45.94		23.193		30.01		6.959		7.97		49.704		58.36	
10.9	55.003	290	45.81	13	23.419	226	27.72	229	7.326	367	6.79	118	49.926	222	56.31	205
20.9	55.325	322	45.85	4	23.675	256	25.58	214	7.740	414	5.88	91	50.178	252	54.36	195
30.8	55.669	344	46.07	22	23.951	276	23.66	192	8.188	448	5.28	60	50.450	272	52.61	175
Feb. 9.8	56.027	358	46.42	35	24.242	291	22.05	161	8.659	471	4.98	30	50.737	287	51.11	150
19.8	56.390	363	46.89	47	24.541	299	20.81	124	9.141	482	4.95	3	51.032	295	49.94	117
Mar. 1.8	56.752	362	47.45	56	24.841	300	19.99	82	9.628	487	5.21	26	51.327	295	49.13	81
11.7	57.108	356	48.07	62	25.136	295	19.61	38	10.108	480	5.72	51	51.619	292	48.69	44
21.7	57.452	344	48.74	67	25.421	285	19.67	6	10.576	468	6.47	75	51.903	284	48.67	2
31.7	57.781	329	49.44	70	25.691	270	20.16	49	11.024	448	7.42	95	52.173	270	49.03	36
Apr. 10.7	58.090	309	50.16	72	25.945	254	21.06	90	11.449	425	8.57	115	52.427	254	49.76	73
20.6	58.378	288	50.89	73	26.178	233	22.31	125	11.842	393	9.89	132	52.663	236	50.81	105
30.6	58.639	261	51.64	75	26.387	209	23.85	154	12.200	358	11.34	145	52.875	212	52.12	131
May 10.6	58.872	233	52.39	75	26.570	183	25.62	177	12.518	318	12.92	158	53.064	189	53.64	152
20.5	59.072	200	53.14	75	26.723	153	27.54	192	12.791	273	14.60	168	53.224	160	55.31	167
30.5	59.236	164	53.90	76	26.844	121	29.56	202	13.013	222	16.33	173	53.353	129	57.07	176
June 9.5	59.361	125	54.64	74	26.933	89	31.60	204	13.180	167	18.08	175	53.450	97	58.85	178
19.5	59.445	84	55.36	72	26.985	52	33.61	201	13.288	108	19.81	173	53.512	62	60.61	176
29.4	59.484	39	56.03	67	27.000	15	35.52	191	13.335	47	21.47	166	53.538	26	62.28	167
July 9.4	59.479	5	56.65	62	26.978	22	37.30	178	13.322	13	23.03	156	53.527	11	63.85	157
19.4	59.431	48	57.18	53	26.921	57	38.89	159	13.247	75	24.43	140	53.480	47	65.27	142
29.4	59.340	91	57.60	42	26.830	91	40.27	138	13.113	134	25.62	119	53.398	82	66.50	123
Aug. 8.3	59.211	129	57.88	28	26.706	124	41.41	114	12.927	186	26.57	95	53.284	114	67.54	104
18.3	59.050	161	58.01	13	26.558	148	42.30	89	12.696	231	27.21	64	53.144	140	68.36	82
28.3	58.865	185	57.98	3	26.388	170	42.90	60	12.429	267	27.53	32	52.982	162	68.94	58
Sept. 7.2	58.663	202	57.76	22	26.205	183	43.22	32	12.143	286	27.52	1	52.806	176	69.28	34
17.2	58.456	207	57.36	40	26.016	189	43.25	3	11.848	295	27.14	38	52.624	182	69.38	10
27.2	58.255	201	56.80	56	25.832	184	42.96	29	11.557	291	26.41	73	52.445	179	69.22	16
Oct. 7.2	58.072	183	56.08	72	25.662	170	42.37	59	11.291	266	25.34	107	52.279	166	68.80	42
17.1	57.918	154	55.26	82	25.514	148	41.49	88	11.063	228	24.00	134	52.134	145	68.11	69
27.1	57.805	113	54.35	91	25.398	116	40.30	119	10.886	177	22.39	161	52.020	114	67.16	95
Nov. 6.1	57.740	65	53.41	94	25.321	77	38.83	147	10.773	113	20.62	177	51.945	75	65.96	120
16.1	57.730	10	52.49	92	25.288	33	37.08	175	10.734	39	18.74	188	51.913	32	64.51	145
26.0	57.779	49	51.63	86	25.304	16	35.11	197	10.772	38	16.82	192	51.929	16	62.83	168
Dec. 6.0	57.887	108	50.89	74	25.370	66	32.94	217	10.889	117	14.95	187	51.994	65	60.98	185
16.0	58.051	164	50.29	60	25.485	115	30.64	230	11.084	195	13.20	175	52.107	113	58.99	199
25.9	58.269	218	49.85	44	25.645	160	28.28	236	11.350	266	11.63	157	52.265	158	56.91	208
35.9	58.531	262	49.61	24	25.846	201	25.93	235	11.679	329	10.29	134	52.463	198	54.82	209
Mean Place	54.788		51.15		23.544		32.73		7.292		15.54		49.991		59.96	
Sec δ, Tan δ	1.208		−0.678		1.036		+0.270		1.663		−1.329		1.014		+0.167	
Dψα, Dωα	+0.08		−0.01		+0.05		+0.01		+0.09		−0.03		+0.06		0.00	
Dψδ, Dωδ	−0.1		−0.9		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	30 Ophiuchi. Mag. 5.0				ε Herculis. Mag. 3.9				*d* Herculis. Mag. 5.3				η Ophiuchi. Mag. 2.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 16 56		° ′ − 4 6		h m 16 57		° ′ +31 2		h m 16 58		° ′ +33 40		h m 17 5		° ′ −15 37	
	s		″		s		″		s		″		s		″	
Jan. 0.9	47.162		7.08		10.695		37.21		36.064		60.37		43.698		30.05	
10.9	47.392	230	8.47	139	10.913	218	34.35	286	36.283	219	57.43	294	43.932	234	30.79	74
20.9	47.650	258	9.84	137	11.169	256	31.72	263	36.540	257	54.73	270	44.198	266	31.57	78
30.8	47.927	277	11.13	129	11.452	283	29.40	232	36.826	286	52.36	237	44.484	286	32.37	80
Feb. 9.8	48.219	292	12.27	114	11.757	305	27.50	190	37.135	309	50.42	194	44.786	302	33.12	75
19.8	48.517	298	13.24	97	12.073	316	26.09	141	37.456	321	48.97	145	45.096	310	33.80	68
Mar. 1.8	48.816	299	13.97	73	12.393	320	25.20	89	37.783	327	48.08	89	45.408	312	34.37	57
11.7	49.112	296	14.45	48	12.712	319	24.88	32	38.108	325	47.75	33	45.717	309	34.82	45
21.7	49.399	287	14.65	20	13.020	308	25.11	23	38.424	316	48.01	26	46.019	302	35.10	28
31.7	49.674	275	14.60	5	13.316	296	25.90	79	38.725	301	48.83	82	46.311	292	35.24	14
Apr. 10.7	49.934	260	14.28	32	13.592	276	27.18	128	39.007	282	50.16	133	46.589	278	35.24	0
20.6	50.178	244	13.75	53	13.843	251	28.91	173	39.264	257	51.95	179	46.850	261	35.10	14
30.6	50.400	222	13.02	73	14.067	224	31.01	210	39.492	228	54.12	217	47.092	242	34.85	25
May 10.6	50.598	198	12.15	87	14.260	193	33.39	238	39.687	195	56.59	247	47.310	218	34.53	32
20.5	50.770	172	11.18	97	14.418	158	35.99	260	39.848	161	59.26	267	47.502	192	34.14	39
30.5	50.913	143	10.14	104	14.539	121	38.68	269	39.968	120	62.05	279	47.663	161	33.73	41
June 9.5	51.024	111	9.07	107	14.621	82	41.41	273	40.049	81	64.88	283	47.792	129	33.30	43
19.5	51.100	76	8.02	105	14.663	42	44.09	268	40.088	39	67.65	277	47.886	94	32.88	42
29.4	51.140	40	7.01	101	14.663	0	46.64	255	40.084	4	70.29	264	47.941	55	32.49	39
July 9.4	51.144	4	6.06	95	14.621	42	49.02	238	40.039	45	72.75	246	47.957	16	32.11	38
19.4	51.110	34	5.20	86	14.539	82	51.14	212	39.951	88	74.94	219	47.934	23	31.77	34
29.4	51.041	69	4.44	76	14.419	120	52.98	184	39.825	126	76.85	191	47.872	62	31.46	31
Aug. 8.3	50.940	101	3.79	65	14.265	154	54.49	151	39.663	162	78.41	156	47.776	96	31.17	29
18.3	50.810	130	3.24	55	14.083	182	55.63	114	39.472	191	79.59	118	47.649	127	30.91	26
28.3	50.658	152	2.80	44	13.877	206	56.39	76	39.257	215	80.37	78	47.497	152	30.65	26
Sept. 7.2	50.490	168	2.49	31	13.656	221	56.76	37	39.028	229	80.74	37	47.326	171	30.41	24
17.2	50.316	174	2.31	18	13.429	227	56.71	5	38.792	236	80.69	5	47.148	178	30.18	23
27.2	50.145	171	2.25	6	13.205	224	56.26	45	38.558	234	80.22	47	46.972	176	29.97	21
Oct. 7.2	49.987	158	2.33	8	12.995	210	55.39	87	38.338	220	79.31	91	46.808	164	29.78	19
17.1	49.849	138	2.57	24	12.807	188	54.11	128	38.140	198	77.98	133	46.664	144	29.63	15
27.1	49.743	106	2.96	39	12.651	156	52.44	167	37.975	165	76.25	173	46.552	112	29.54	9
Nov. 6.1	49.676	67	3.52	56	12.536	115	50.41	203	37.852	123	74.15	210	46.479	73	29.53	1
16.1	49.653	23	4.26	74	12.468	68	48.07	234	37.776	76	71.71	244	46.452	27	29.63	10
26.0	49.678	25	5.17	91	12.452	16	45.44	263	37.753	23	69.00	271	46.475	23	29.86	23
Dec. 6.0	49.752	74	6.24	107	12.490	38	42.61	283	37.785	32	66.08	292	46.548	73	30.20	34
16.0	49.873	121	7.46	122	12.581	91	39.64	297	37.872	87	63.02	306	46.671	123	30.68	48
25.9	50.039	166	8.78	132	12.726	145	36.63	301	38.014	142	59.92	310	46.840	169	31.27	59
35.9	50.244	205	10.17	139	12.915	189	33.67	296	38.202	188	56.89	303	47.050	210	31.98	71
Mean Place	47.325		7.65		11.394		41.50		36.841		64.85		43.825		32.47	
Sec δ, Tan δ	1.003		−0.072		1.167		+0.602		1.202		+0.667		1.038		−0.280	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		0.00		+0.05		+0.01		+0.04		+0.01		+0.07		0.00	
$\psi\delta$, $D_\omega\delta$	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**η Scorpii.**				**ζ Draconis.**				**α Herculis.**				**δ Herculis.**			
	Mag. 3.4				Mag. 3.2				Var. 3.1–3.9				Mag. 3.2			
	Right Ascension.		**Declination.**		**Right Ascension.**		**Declination.**		**Right Ascension.**		**Declination.**		**Right Ascension.**		**Declination.**	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 6		−43 7		17 8		+65 48		17 10		+14 28		17 11		+24 55	
	s		″		s		″		s		″		s		″	
Jan. 0.9	20.685		56.03		29.85		45.50		56.804		52.56		41.636		59.32	
10.9	20.986	301	55.25	78	30.13	28	42.10	340	57.010	206	50.31	225	41.840	204	56.64	268
20.9	21.326	340	54.67	58	30.50	37	39.01	309	57.247	237	48.20	211	42.078	238	54.15	249
30.9	21.696	370	54.31	36	30.94	44	36.32	269	57.510	263	46.28	192	42.345	267	51.94	221
Feb. 9.8	22.085	389	54.17	14	31.44	50	34.15	217	57.790	280	44.66	162	42.631	286	50.07	187
19.8	22.488	403	54.21	4	31.98	54	32.56	159	58.081	291	43.39	127	42.931	300	48.64	143
Mar. 1.8	22.893	405	54.43	22	32.55	57	31.64	92	58.376	295	42.53	86	43.239	308	47.68	96
11.7	23.297	404	54.80	37	33.13	58	31.39	25	58.671	295	42.09	44	43.544	305	47.26	42
21.7	23.691	394	55.32	52	33.70	57	31.84	45	58.961	290	42.09	0	43.845	301	47.35	9
31.7	24.073	382	55.97	65	34.25	55	32.92	108	59.240	279	42.53	44	44.135	290	47.96	61
Apr. 10.7	24.438	365	56.73	76	34.75	50	34.61	169	59.504	264	43.37	84	44.410	275	49.04	108
20.6	24.779	341	57.59	86	35.20	45	36.83	222	59.752	248	44.58	121	44.663	253	50.54	150
30.6	25.094	315	58.54	95	35.57	37	39.50	267	59.978	226	46.09	151	44.895	232	52.40	186
May 10.6	25.378	284	59.57	103	35.87	30	42.52	302	60.179	201	47.84	175	45.098	203	54.56	216
20.6	25.627	249	60.67	110	36.10	23	45.76	324	60.353	174	49.77	193	45.270	172	56.91	235
30.5	25.835	208	61.84	117	36.23	13	49.15	339	60.496	143	51.81	204	45.410	140	59.39	248
June 9.5	26.000	165	63.02	118	36.28	5	52.57	342	60.606	110	53.88	207	45.512	102	61.92	253
19.5	26.117	117	64.21	119	36.24	4	55.93	336	60.679	73	55.93	205	45.575	63	64.42	250
29.4	26.183	66	65.36	115	36.10	14	59.13	320	60.715	36	57.91	198	45.599	24	66.83	241
July 9.4	26.198	15	66.48	112	35.88	22	62.08	295	60.713	2	59.76	185	45.582	17	69.09	226
19.4	26.160	38	67.49	101	35.58	30	64.74	266	60.673	40	61.44	168	45.526	56	71.13	204
29.4	26.072	88	68.37	88	35.22	36	67.02	228	60.596	77	62.92	148	45.432	94	72.92	179
Aug. 8.3	25.938	134	69.07	70	34.79	43	68.89	187	60.485	111	64.16	124	45.301	131	74.41	149
18.3	25.764	174	69.58	51	34.31	48	70.28	139	60.345	140	65.16	100	45.142	159	75.59	118
28.3	25.557	207	69.85	27	33.79	52	71.19	91	60.181	164	65.87	71	44.957	185	76.43	84
Sept. 7.3	25.329	228	69.88	3	33.24	55	71.59	40	60.000	181	66.32	45	44.756	201	76.91	48
17.2	25.090	239	69.63	25	32.68	56	71.47	12	59.811	189	66.47	15	44.546	210	77.02	11
27.2	24.853	237	69.13	50	32.13	55	70.82	65	59.622	189	66.31	16	44.336	210	76.75	27
Oct. 7.2	24.632	221	68.37	76	31.59	54	69.65	117	59.442	180	65.86	45	44.136	200	76.10	65
17.1	24.439	193	67.41	96	31.10	49	67.98	167	59.284	158	65.11	75	43.956	180	75.08	102
27.1	24.287	152	66.25	116	30.65	45	65.83	215	59.153	131	64.05	106	43.806	150	73.71	137
Nov. 6.1	24.187	100	64.96	129	30.28	37	63.25	258	59.058	95	62.72	133	43.693	113	71.97	174
16.1	24.147	40	63.61	135	29.98	30	60.28	297	59.006	52	61.10	162	43.624	69	69.92	205
26.0	24.170	23	62.23	138	29.79	19	57.01	327	59.001	5	59.25	185	43.604	20	67.61	231
Dec. 6.0	24.261	91	60.91	132	29.69	10	53.51	350	59.045	44	57.19	206	43.634	30	65.07	254
16.0	24.415	154	59.69	122	29.69	0	49.88	363	59.137	92	54.99	220	43.716	82	62.38	269
26.0	24.629	214	58.61	108	29.80	11	46.24	364	59.276	139	52.71	228	43.848	132	59.62	276
35.9	24.897	268	57.71	90	30.01	21	42.71	353	59.456	180	50.42	229	44.023	175	56.88	274
Mean Place	20.905		62.07		32.982		51.38		57.199		54.00		42.222		61.90	
Sec δ, Tan δ	1.370		−0.937		2.441		+2.227		1.033		+0.258		1.103		+0.465	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.09		−0.01		0.00		+0.03		+0.05		0.00		+0.05		+0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Herculis. Mag. 3.4				θ Ophiuchi. Mag. 3.4				ω Herculis. Mag. 5.4				β Aræ. Mag. 2.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		°	
	17 12		+36 53		17 17		−24 55		17 17		+32 33		17 18		−55 2	
	s		″		s		″		s		″		s		″	
Jan. 0.9	12.580		55.11		1.838		8.00		36.863		72.90		33.267		10.13	
10.9	12.786	206	52.07	304	2.077	239	8.16	16	37.062	199	69.95	295	33.617	350	8.61	152
20.9	13.033	247	49.25	282	2.351	274	8.42	26	37.299	237	67.20	275	34.021	404	7.33	128
30.9	13.313	280	46.77	248	2.649	298	8.74	32	37.570	271	64.75	245	34.467	446	6.33	100
Feb. 9.8	13.621	308	44.70	207	2.963	314	9.11	37	37.864	294	62.70	205	34.944	477	5.62	71
19.8	13.945	324	43.14	156	3.288	325	9.49	38	38.176	312	61.12	158	35.442	498	5.20	42
Mar. 1.8	14.278	333	42.14	100	3.618	330	9.86	37	38.496	320	60.07	105	35.949	507	5.06	14
11.8	14.612	334	41.74	40	3.947	329	10.20	34	38.818	322	59.59	48	36.458	509	5.21	15
21.7	14.940	328	41.93	19	4.270	323	10.49	29	39.135	317	59.68	9	36.960	502	5.60	39
31.7	15.257	317	42.71	78	4.584	314	10.71	22	39.441	306	60.33	65	37.448	488	6.26	66
Apr. 10.7	15.554	297	44.02	131	4.885	301	10.90	19	39.731	290	61.51	118	37.916	468	7.14	88
20.6	15.828	274	45.82	180	5.171	286	11.03	13	40.001	270	63.16	165	38.357	441	8.23	109
30.6	16.073	245	48.03	221	5.437	266	11.13	10	40.244	243	65.21	205	38.766	409	9.51	128
May 10.6	16.285	212	50.57	254	5.680	243	11.21	8	40.457	213	67.57	236	39.134	368	10.95	144
20.6	16.460	175	53.33	276	5.895	215	11.28	7	40.637	180	70.17	260	39.457	323	12.56	161
30.5	16.596	136	56.24	291	6.080	185	11.35	7	40.781	144	72.91	274	39.728	271	14.26	170
June 9.5	16.690	94	59.19	295	6.229	149	11.44	9	40.884	103	75.71	280	39.942	214	16.04	178
19.5	16.739	49	62.11	292	6.340	111	11.55	11	40.945	61	78.49	278	40.093	151	17.85	181
29.5	16.743	4	64.93	282	6.411	71	11.67	12	40.963	18	81.17	268	40.178	85	19.65	180
July 9.4	16.701	42	67.54	261	6.439	28	11.80	13	40.937	26	83.67	250	40.197	19	21.38	173
19.4	16.615	86	69.92	238	6.424	15	11.92	12	40.869	68	85.96	229	40.146	51	22.98	160
29.4	16.488	127	71.99	207	6.368	56	12.03	11	40.760	109	87.95	199	40.031	115	24.42	144
Aug. 8.3	16.323	165	73.72	173	6.273	95	12.11	8	40.614	146	89.62	167	39.856	175	25.63	121
18.3	16.124	199	75.07	135	6.144	129	12.14	3	40.435	179	90.93	131	39.627	229	26.56	93
28.3	15.901	223	76.02	95	5.985	159	12.10	4	40.229	206	91.87	94	39.355	272	27.18	62
Sept. 7.3	15.659	242	76.53	51	5.808	177	11.99	11	40.006	223	92.40	53	39.053	302	27.44	26
17.2	15.408	251	76.60	7	5.619	189	11.80	19	39.773	233	92.51	11	38.735	318	27.33	11
27.2	15.158	250	76.22	38	5.429	190	11.52	28	39.539	234	92.19	32	38.416	319	26.86	47
Oct. 7.2	14.918	240	75.39	83	5.250	179	11.18	34	39.314	225	91.45	74	38.115	301	26.01	85
17.2	14.701	217	74.12	127	5.093	157	10.78	40	39.110	204	90.28	117	37.847	268	24.82	119
27.1	14.514	187	72.43	169	4.968	125	10.36	42	38.935	175	88.71	157	37.627	220	23.34	148
Nov. 6.1	14.368	146	70.34	209	4.883	85	9.93	43	38.799	136	86.77	194	37.469	158	21.60	174
16.1	14.270	98	67.90	244	4.845	38	9.53	40	38.708	91	84.48	229	37.385	84	19.71	189
26.0	14.225	45	65.16	274	4.859	14	9.20	33	38.667	41	81.88	260	37.380	5	17.71	200
Dec. 6.0	14.236	11	62.18	298	4.926	67	8.96	24	38.680	13	79.05	283	37.456	76	15.70	201
16.0	14.304	68	59.05	313	5.045	119	8.82	14	38.747	67	76.07	298	37.615	159	13.74	196
26.0	14.426	122	55.87	318	5.214	169	8.80	2	38.867	120	73.00	307	37.852	237	11.90	184
35.9	14.601	175	52.74	313	5.427	213	8.89	9	39.036	169	69.98	302	38.158	306	10.25	165
Mean Place	13.493		58.84		1.984		11.69		37.652		75.81		33.787		17.07	
Sec δ, Tan δ	1.250		+0.751		1.103		−0.465		1.187		+0.639		1.763		−1.453	
$D_\psi a$, $D_\omega a$	+0.04		+0.01		+0.07		−0.01		+0.04		+0.01		+0.10		−0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	b Ophiuchi. Mag. 4.3				σ Ophiuchi. Mag. 4.4				δ Aræ. Mag. 3.8				α Aræ. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 17 21		° ′ −24 6		h m 17 22		° ′ + 4 12		h m 17 23		° ′ −60 36		h m 17 25		° ′ −49 48	
	s		″		s		″		s		″		s		″	
Jan. 0.9	25.114	234	4.10	18	29.414	202	35.66	174	46.11	38	58.45	182	34.238	307	42.20	129
10.9	25.348	268	4.28	28	29.616	231	33.92	167	46.49	45	56.63	155	34.545	355	40.91	108
20.9	25.616	292	4.56	33	29.847	257	32.25	154	46.94	50	55.08	126	34.900	394	39.83	85
30.9	25.908	311	4.89	37	30.104	274	30.71	134	47.44	53	53.82	95	35.294	420	38.98	60
Feb. 9.8	26.219	321	5.26	37	30.378	285	29.37	107	47.97	57	52.87	61	35.714	438	38.38	37
19.8	26.540	327	5.63	36	30.663	291	28.30	77	48.54	58	52.26	29	36.152	450	38.01	13
Mar. 1.8	26.867	326	5.99	31	30.954	292	27.53	44	49.12	57	51.97	— 2	36.602	451	37.88	— 8
11.8	27.193	322	6.30	24	31.246	288	27.09	9	49.69	58	51.99	34	37.053	446	37.96	30
21.7	27.515	314	6.54	20	31.534	280	27.00	— 26	50.27	56	52.33	63	37.499	436	38.26	49
31.7	27.829	301	6.74	13	31.814	269	27.26	59	50.83	54	52.96	92	37.935	421	38.75	68
Apr. 10.7	28.130	286	6.87	8	32.083	253	27.85	87	51.37	51	53.88	117	38.356	397	39.43	85
20.6	28.416	266	6.95	4	32.336	235	28.72	114	51.88	47	55.05	139	38.753	372	40.28	101
30.6	28.682	245	6.99	1	32.571	213	29.86	132	52.35	43	56.44	161	39.125	338	41.29	116
May 10.6	28.927	217	7.00	0	32.784	189	31.18	147	52.78	36	58.05	177	39.463	299	42.45	129
20.6	29.144	188	7.00	1	32.973	159	32.65	156	53.14	31	59.82	191	39.762	255	43.74	138
30.5	29.332	153	7.01	3	33.132	127	34.21	159	53.45	25	61.73	200	40.017	205	45.12	147
June 9.5	29.485	115	7.04	4	33.259	94	35.80	158	53.70	17	63.73	205	40.222	151	46.59	150
19.5	29.600	74	7.08	6	33.353	56	37.38	152	53.87	10	65.78	205	40.373	92	48.09	150
29.5	29.674	32	7.14	8	33.409	18	38.90	143	53.97	2	67.83	198	40.465	33	49.59	146
July 9.4	29.706	— 10	7.22	9	33.427	— 20	40.33	131	53.99	— 6	69.81	185	40.498	— 27	51.05	138
19.4	29.696	52	7.31	8	33.407	58	41.64	114	53.93	14	71.66	167	40.471	86	52.43	123
29.4	29.644	91	7.39	6	33.349	92	42.78	98	53.79	21	73.33	142	40.385	142	53.66	107
Aug. 8.3	29.553	127	7.45	3	33.257	124	43.76	81	53.58	26	74.75	112	40.243	188	54:73	82
18.3	29.426	155	7.48	— 3	33.133	149	44.57	60	53.32	32	75.87	77	40.055	230	55.55	57
28.3	29.271	176	7.45	10	32.984	168	45.17	42	53.00	35	76.64	38	39.825	260	56.12	26
Sept. 7.3	29.095	188	7.35	17	32.816	178	45.59	20	52.65	38	77.02	— 1	39.565	275	56.38	— 5
17.2	28.907	189	7.18	24	32.638	180	45.79	0	52.27	37	77.01	45	39.290	277	56.33	38
27.2	28.718	180	6.94	31	32.458	172	45.79	22	51.90	36	76.56	86	39.013	264	55.95	70
Oct. 7.2	28.538	158	6.63	35	32.286	153	45.57	43	51.54	32	75.70	124	38.749	237	55.25	99
17.2	28.380	128	6.28	38	32.133	127	45.14	66	51.22	27	74.46	159	38.512	195	54.26	126
27.1	28.252	88	5.90	38	32.006	93	44.48	87	50.95	21	72.87	187	38.317	140	53.00	146
Nov. 6.1	28.164	41	5.52	34	31.913	50	43.61	110	50.74	10	71.00	209	38.177	78	51.54	162
16.1	28.123	— 9	5.18	29	31.863	5	42.51	129	50.64	3	68.91	222	38.099	7	49.92	170
26.0	28.132	62	4.89	20	31.858	— 43	41.22	147	50.61	— 6	66.69	227	38.092	— 64	48.22	172
Dec. 6.0	28.194	114	4.69	10	31.901	90	39.75	163	50.67	16	64.42	224	38.156	138	46.50	166
16.0	28.308	163	4.59	— 2	31.991	135	38.12	171	50.83	25	62.18	213	38.294	206	44.84	156
26.0	28.471	208	4.61	12	32.126	176	36.41	175	51.08	33	60.05	195	38.500	268	43.28	141
35.9	28.679		4.73		32.302		34.66		51.41		58.10		38.768		41.87	
Mean Place	25.270		7.68		29.704		35.37		46.851		65.61		34.640		48.39	
Sec δ, Tan δ	1.096		−0.447		1.003		+0.074		2.038		−1.776		1.550		−1.184	
$D_\psi a$, $D_\omega a$	+0.07		−0.01		+0.06		0.00		+0.11		−0.02		+0.09		−0.01	
$D_\psi \delta$, $D_\omega \delta$	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Herculis. Mag. 4.5				λ Scorpii. Mag. 1.7				β Draconis. Mag. 3.0				α Ophiuchi. Mag. 2.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 27		+26 10		17 28		−37 2		17 28		+52 21		17 31		+12 36	
	s		″		s		″		s		″		s		″	
Jan. 1.0	27.227		13.48		6.145		40.34		34.391		35.73		10.020		64.42	
10.9	27.415	188	10.77	271	6.402	257	39.73	61	34.590	199	32.35	338	10.208	188	62.29	213
20.9	27.640	225	8.24	253	6.698	296	39.27	46	34.848	258	29.21	314	10.430	222	60.24	205
30.9	27.896	256	5.95	229	7.022	324	38.95	32	35.157	309	26.42	279	10.679	249	58.39	185
Feb. 9.8	28.174	278	4.01	194	7.370	348	38.78	17	35.508	351	24.09	233	10.948	269	56.80	159
19.8	28.469	295	2.50	151	7.731	361	38.73	5	35.889	381	22.31	178	11.230	282	55.53	127
Mar. 1.8	28.774	305	1.47	103	8.100	369	38.79	6	36.292	403	21.13	118	11.520	290	54.64	89
11.8	29.081	307	0.96	51	8.471	371	38.94	15	36.702	410	20.61	52	11.813	293	54.15	49
21.7	29.385	304	0.99	3	8.838	367	39.18	24	37.111	409	20.74	13	12.103	290	54.09	6
31.7	29.682	297	1.54	55	9.197	359	39.48	30	37.507	396	21.52	78	12.387	284	54.46	37
Apr. 10.7	29.965	283	2.58	104	9.543	346	39.86	38	37.883	376	22.92	140	12.660	273	55.23	77
20.7	30.230	265	4.06	148	9.873	330	40.30	44	38.228	345	24.86	194	12.918	258	56.36	113
30.6	30.475	245	5.92	186	10.181	308	40.81	51	38.535	307	27.27	241	13.159	241	57.78	142
May 10.6	30.692	217	8.10	218	10.465	284	41.38	57	38.798	263	30.05	278	13.376	217	59.47	169
20.6	30.880	188	10.50	240	10.717	252	42.02	64	39.012	214	33.12	307	13.569	193	61.33	186
30.5	31.034	154	13.06	256	10.935	218	42.73	71	39.171	159	36.37	325	13.731	162	63.30	197
June 9.5	31.151	117	15.68	262	11.114	179	43.48	75	39.273	102	39.70	333	13.861	130	65.34	204
19.5	31.229	78	18.29	261	11.249	135	44.26	78	39.315	42	43.02	332	13.956	95	67.35	201
29.5	31.266	37	20.81	252	11.338	89	45.06	80	39.297	18	46.24	322	14.012	56	69.31	196
July 9.4	31.262	4	23.19	238	11.379	41	45.85	79	39.220	77	49.27	303	14.029	17	71.16	185
19.4	31.217	45	25.37	218	11.369	10	46.61	76	39.085	135	52.04	277	14.007	22	72.84	168
29.4	31.131	86	27.31	194	11.312	57	47.29	68	38.895	190	54.49	245	13.946	61	74.34	150
Aug. 8.4	31.008	123	28.94	163	11.209	103	47.87	58	38.657	238	56.57	208	13.851	95	75.61	127
18.3	30.852	156	30.26	132	11.065	144	48.33	46	38.377	280	58.22	165	13.722	129	76.66	105
28.3	30.670	182	31.25	99	10.888	177	48.62	29	38.062	315	59.42	120	13.567	155	77.45	79
Sept. 7.3	30.468	202	31.86	61	10.686	202	48.73	11	37.724	338	60.14	72	13.392	175	77.97	52
17.2	30.254	214	32.09	23	10.468	218	48.64	9	37.370	354	60.36	22	13.206	186	78.21	24
27.2	30.038	216	31.94	15	10.250	218	48.35	29	37.014	356	60.07	29	13.017	189	78.18	3
Oct. 7.2	29.831	207	31.40	54	10.041	209	47.86	49	36.670	344	59.26	81	12.834	183	77.85	33
17.2	29.640	191	30.48	92	9.853	188	47.19	67	36.346	324	57.96	130	12.669	165	77.23	62
27.1	29.476	164	29.18	130	9.700	153	46.37	82	36.058	288	56.18	178	12.528	141	76.33	90
Nov. 6.1	29.348	128	27.52	166	9.591	109	45.44	93	35.815	243	53.94	224	12.422	106	75.15	118
16.1	29.263	85	25.53	199	9.534	57	44.45	99	35.629	186	51.29	265	12.356	66	73.71	144
26.1	29.225	38	23.26	227	9.534	0	43.43	102	35.504	125	48.30	299	12.335	21	72.01	170
Dec. 6.0	29.238	13	20.74	252	9.594	60	42.43	100	35.449	55	45.04	326	12.361	26	70.12	189
16.0	29.302	64	18.06	268	9.713	119	41.51	92	35.464	15	41.60	344	12.436	75	68.08	204
26.0	29.416	114	15.30	276	9.887	174	40.69	82	35.552	88	38.09	351	12.556	120	65.92	216
35.9	29.576	160	12.53	277	10.112	225	40.01	68	35.708	156	34.61	348	12.718	162	63.75	217
Mean Place	27.870		15.12		6.375		45.23		36.101		39.00		10.425		64.63	
Sec δ, Tan δ	1.114		+0.491		1.253		−0.755		1.638		+1.297		1.025		+0.224	
$D_\psi\alpha$, $D_\omega\alpha$	+0.05		0.00		+0.08		−0.01		+0.03		+0.01		+0.06		0.00	
$D_\psi\delta$, $D_\omega\delta$	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Serpentis. Mag. 3.6				ι Herculis. Mag. 3.8				ω Draconis. Mag. 4.9				η Pavonis. Mag. 3.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 32		−15 20		17 37		+46 2		17 37		+68 47		17 37		−64 40	
	s		″		s		″		s		″		s		″	
Jan. 1.0	56.621	210	52.20	63	9.371	180	53.66	329	21.62	22	40.91	346	45.64	40	66.30	212
10.9	56.831	242	52.83	66	9.551	233	50.37	307	21.84	34	37.45	325	46.04	47	64.18	188
20.9	57.073	269	53.49	67	9.784	278	47.30	276	22.18	42	34.20	288	46.51	54	62.30	157
30.9	57.342	286	54.16	62	10.062	315	44.54	233	22.60	51	31.32	243	47.05	60	60.73	126
Feb. 9.8	57.628	298	54.78	54	10.377	342	42.21	182	23.11	57	28.89	187	47.65	62	59.47	92
19.8	57.926	307	55.32	42	10.719	360	40.39	125	23.68	62	27.02	126	48.27	65	58.55	56
Mar. 1.8	58.233	307	55.74	28	11.079	369	39.14	61	24.30	64	25.76	59	48.92	66	57.99	22
11.8	58.540	304	56.02	15	11.448	369	38.53	3	24.94	64	25.17	10	49.58	66	57.77	14
21.7	58.844	299	56.17	1	11.817	362	38.56	66	25.58	63	25.27	75	50.24	64	57.91	45
31.7	59.143	290	56.16	16	12.179	344	39.22	125	26.21	59	26.02	140	50.88	62	58.36	77
Apr. 10.7	59.433	276	56.00	29	12.523	321	40.47	180	26.80	55	27.42	196	51.50	58	59.13	107
20.7	59.709	259	55.71	39	12.844	291	42.27	227	27.35	48	29.38	246	52.08	56	60.20	135
30.6	59.968	239	55.32	46	13.135	254	44.54	265	27.83	39	31.84	285	52.64	50	61.55	160
May 10.6	60.207	214	54.86	52	13.389	213	47.19	293	28.22	30	34.69	316	53.14	44	63.15	180
20.6	60.421	187	54.34	54	13.602	167	50.12	313	28.52	21	37.85	335	53.58	38	64.95	198
30.5	60.608	153	53.80	52	13.769	117	53.25	323	28.73	11	41.20	346	53.96	30	66.93	213
June 9.5	60.761	118	53.28	51	13.886	66	56.48	323	28.84	1	44.66	346	54.26	22	69.06	219
19.5	60.879	80	52.77	47	13.952	12	59.71	315	28.85	9	48.12	336	54.48	12	71.25	221
29.5	60.959	39	52.30	42	13.964	41	62.86	298	28.76	21	51.48	319	54.60	3	73.46	218
July 9.4	60.998	0	51.88	37	13.923	94	65.84	275	28.55	29	54.67	293	54.63	5	75.64	206
19.4	60.998	43	51.51	32	13.829	144	68.59	245	28.26	38	57.60	260	54.58	14	77.70	190
29.4	60.955	80	51.19	27	13.685	188	71.04	210	27.88	46	60.20	222	54.44	22	79.60	165
Aug. 8.4	60.875	115	50.92	22	13.497	229	73.14	170	27.42	52	62.42	179	54.22	30	81.25	137
18.3	60.760	143	50.70	20	13.268	262	74.84	127	26.90	58	64.21	133	53.92	37	82.62	100
28.3	60.617	166	50.50	18	13.006	286	76.11	81	26.32	62	65.54	83	53.55	40	83.62	59
Sept. 7.3	60.451	178	50.32	16	12.720	301	76.92	34	25.70	64	66.37	32	53.15	43	84.21	16
17.2	60.273	181	50.16	15	12.419	305	77.26	16	25.06	65	66.69	21	52.72	44	84.37	29
27.2	60.092	174	50.01	12	12.114	298	77.10	64	24.41	63	66.48	74	52.28	43	84.08	74
Oct. 7.2	59.918	156	49.89	8	11.816	280	76.46	113	23.78	60	65.74	126	51.85	39	83.34	118
17.2	59.762	128	49.81	4	11.536	249	75.33	161	23.18	56	64.48	176	51.46	33	82.16	156
27.1	59.634	95	49.77	3	11.287	208	73.72	204	22.62	49	62.72	228	51.13	26	80.60	190
Nov. 6.1	59.539	50	49.80	11	11.079	161	71.68	246	22.13	41	60.49	267	50.87	17	78.70	218
16.1	59.489	3	49.91	21	10.918	104	69.22	281	21.72	31	57.82	303	50.70	8	76.52	235
26.1	59.486	46	50.12	31	10.814	43	66.41	309	21.41	19	54.79	331	50.62	4	74.17	245
Dec. 6.0	59.532	96	50.43	42	10.771	20	63.32	328	21.22	9	51.48	351	50.66	15	71.72	247
16.0	59.628	141	50.85	52	10.791	82	60.04	338	21.13	3	47.97	360	50.81	24	69.25	239
26.0	59.769	184	51.37	60	10.873	144	56.66	337	21.16	15	44.37	355	51.05	34	66.86	224
35.9	59.953		51.97		11.017		53.29		21.31		40.82		51.39		64.62	
Mean Place	56.808		54.85		10.714		55.83		25.432		43.71		46.683		73.12	
Sec δ, Tan δ	1.037		−0.274		1.441		+1.037		2.765		+2.578		2.339		−2.114	
$D_\psi a$, $D_\omega a$	+0.07		0.00		+0.03		+0.01		−0.01		+0.02		+0.11		−0.01	
$D_\psi \delta$, $D_\omega \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

APPARENT PLACES OF STARS, 1919.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Ophiuchi. Mag. 2.9				ι¹ Scorpii. Mag. 3.1				μ Herculis. Mag. 3.5				ψ Draconis. Mag. 4.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 17 39		° ′ + 4 35		h m 17 41		° ′ −40 5		h m 17 43		° ′ +27 45		h m 17 43		° ′ +72 11	
	s		″		s		″		s		″		s		″	
Jan. 1.0	27.917		61.41		54.848		44.04		16.565		61.34		17.78		18.10	
10.9	28.102	185	59.69	172	55.098	250	43.16	88	16.736	171	58.56	278	18.00	22	14.62	348
20.9	28.320	218	58.05	164	55.390	292	42.43	73	16.946	210	55.93	263	18.35	35	11.35	327
30.9	28.564	244	56.53	152	55.714	324	41.86	57	17.188	242	53.54	239	18.82	47	8.42	293
Feb. 9.9	28.829	265	55.20	133	56.065	351	41.43	43	17.458	270	51.49	205	19.39	57	5.94	248
19.8	29.106	277	54.14	106	56.433	368	41.15	28	17.745	287	49.87	162	20.04	65	4.00	194
Mar. 1.8	29.393	287	53.38	76	56.812	379	41.00	15	18.047	302	48.72	115	20.75	71	2.67	133
11.8	29.683	290	52.94	44	57.195	383	40.97	3	18.354	307	48.10	62	21.50	75	1.99	68
21.7	29.972	289	52.87	7	57.577	382	41.05	8	18.662	308	48.02	8	22.25	75	2.01	2
31.7	30.255	283	53.16	29	57.955	378	41.25	20	18.964	302	48.50	48	22.98	73	2.68	67
Apr. 10.7	30.530	275	53.77	61	58.321	366	41.54	29	19.256	292	49.47	97	23.68	70	3.98	130
20.7	30.792	262	54.68	91	58.671	350	41.93	39	19.533	277	50.90	143	24.31	63	5.86	188
30.6	31.038	246	55.85	117	59.002	331	42.42	49	19.789	256	52.74	184	24.87	56	8.25	239
May 10.6	31.265	227	57.23	138	59.308	306	43.01	59	20.021	232	54.92	218	25.34	47	11.04	279
20.6	31.466	201	58.75	152	59.584	276	43.71	70	20.222	201	57.34	242	25.70	36	14.15	311
30.6	31.640	174	60.38	163	59.825	241	44.48	77	20.391	169	59.94	260	25.94	24	17.46	331
June 9.5	31.783	143	62.04	166	60.025	200	45.34	86	20.523	132	62.62	268	26.07	13	20.89	343
19.5	31.891	108	63.69	165	60.182	157	46.25	91	20.616	93	65.31	269	26.07	0	24.34	345
29.5	31.962	71	65.28	159	60.288	106	47.19	94	20.667	51	67.93	262	25.95	12	27.70	336
July 9.4	31.993	31	66.79	151	60.344	56	48.16	97	20.674	7	70.43	250	25.72	23	30.90	320
19.4	31.986	7	68.17	138	60.347	3	49.09	93	20.638	36	72.73	230	25.36	36	33.84	294
29.4	31.940	46	69.38	121	60.298	49	49.96	87	20.560	78	74.79	206	24.91	45	36.47	263
Aug. 8.4	31.857	83	70.44	106	60.201	97	50.73	77	20.442	118	76.56	177	24.36	55	38.74	227
18.3	31.741	116	71.31	87	60.061	140	51.36	63	20.290	152	78.02	146	23.76	60	40.58	184
28.3	31.597	144	71.98	67	59.881	180	51.82	46	20.109	181	79.13	111	23.05	71	41.97	139
Sept. 7.3	31.432	165	72.45	47	59.672	209	52.07	25	19.905	204	79.86	73	22.30	75	42.86	89
17.3	31.254	178	72.71	26	59.447	225	52.12	5	19.687	218	80.21	35	21.53	77	43.25	39
27.2	31.072	182	72.76	5	59.216	231	51.92	20	19.465	222	80.17	4	20.75	78	43.11	14
Oct. 7.2	30.895	177	72.58	18	58.992	224	51.50	42	19.248	217	79.73	44	19.99	76	42.45	66
17.2	30.735	160	72.19	39	58.788	204	50.85	65	19.046	202	78.88	85	19.27	72	41.26	119
27.1	30.598	137	71.57	62	58.617	171	50.02	83	18.869	177	77.64	124	18.59	68	39.57	169
Nov. 6.1	30.494	104	70.74	83	58.489	128	49.03	99	18.724	145	76.03	161	17.98	61	37.40	217
16.1	30.430	64	69.69	105	58.412	77	47.93	110	18.621	103	74.06	197	17.47	51	34.80	260
26.1	30.410	20	68.42	127	58.394	18	46.75	118	18.565	56	71.80	226	17.06	41	31.81	299
Dec. 6.0	30.436	26	66.99	143	58.437	43	45.57	118	18.558	7	69.28	252	16.79	27	28.54	327
16.0	30.509	73	65.40	159	58.542	105	44.43	114	18.602	44	66.57	271	16.65	14	25.05	349
26.0	30.628	119	63.71	169	58.705	163	43.38	105	18.697	95	63.75	282	16.64	1	21.47	358
36.0	30.787	159	61.99	172	58.921	216	42.43	95	18.839	142	60.92	283	16.77	13	17.90	357
Mean Place	28.239		60.53		55.142		48.91		17.267		62.00		22.511		20.25	
Sec δ, Tan δ	1.003		+0.080		1.307		−0.842		1.130		+0.527		3.269		+3.113	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		0.00		+0.08		0.00		+0.05		0.00		−0.02		+0.01	
$D_\psi\delta$, $D_\omega\delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Ophiuchi. Mag. 3.7				ξ Draconis. Mag. 3.9				89 Herculis. Mag. 5.5				85 Draconis. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 17 43		° ′ + 2 44		h m 17 52		° ′ +56 52		h m 17 52		° ′ +26 3		h m 17 52		° ′ +76 58	
	s		″		s		″		s		″		s		″	
Jan. 1.0	49.520		13.59		5.655		64.97		8.481		43.44		57.56		26.97	
10.9	49.702	182	12.00	159	5.819	164	61.52	345	8.644	163	40.75	269	57.78	22	23.53	344
20.9	49.918	216	10.44	156	6.056	237	58.24	328	8.846	202	38.20	255	58.18	40	20.27	326
30.9	50.159	241	9.00	144	6.355	299	55.28	296	9.080	234	35.87	233	58.75	57	17.32	295
Feb. 9.9	50.422	263	7.75	125	6.708	353	52.74	254	9.342	262	33.86	201	59.46	71	14.80	252
19.8	50.698	276	6.73	102	7.103	395	50.72	202	9.623	281	32.25	161	60.29	83	12.79	201
Mar. 1.8	50.984	286	6.00	73	7.528	425	49.31	141	9.918	295	31.11	114	61.21	92	11.38	141
11.8	51.273	289	5.58	42	7.972	444	48.52	79	10.222	304	30.47	64	62.19	98	10.61	77
21.7	51.562	289	5.50	8 —	8.422	450	48.41	11 —	10.527	305	30.36	11 —	63.19	100	10.51	10 —
31.7	51.846	284	5.76	26	8.865	443	48.97	56	10.828	301	30.78	42	64.17	98	11.08	57
Apr. 10.7	52.123	277	6.33	57	9.293	428	50.15	118	11.121	293	31.71	93	65.11	94	12.27	119
20.7	52.388	265	7.18	85	9.691	398	51.92	177	11.400	279	33.10	139	65.98	87	14.04	177
30.6	52.636	248	8.29	111	10.052	361	54.20	228	11.660	260	34.90	180	66.74	76	16.32	228
May 10.6	52.866	230	9.58	129	10.367	315	56.91	271	11.898	238	37.02	212	67.36	62	19.03	271
20.6	53.071	205	11.03	145	10.628	261	59.95	304	12.108	210	39.39	237	67.85	49	22.09	306
30.6	53.251	180	12.56	153	10.831	203	63.22	327	12.286	178	41.96	257	68.19	34	25.34	325
June 9.5	53.399	148	14.13	157	10.968	137	66.61	339	12.430	144	44.61	265	68.35	16	28.74	340
19.5	53.512	113	15.69	156	11.041	73	70.05	344	12.534	104	47.28	267	68.36	1 —	32.18	344
29.5	53.588	76	17.20	151	11.044	3 —	73.43	338	12.596	62	49.89	261	68.20	16	35.56	338
July 9.4	53.626	38 —	18.62	142	10.978	66	76.66	323	12.615	19 —	52.38	249	67.87	33	38.79	323
19.4	53.625	1	19.92	130	10.847	131	79.67	301	12.591	24	54.70	232	67.39	48	41.79	300
29.4	53.584	41	21.06	114	10.652	195	82.38	271	12.525	66	56.78	208	66.77	62	44.50	271
Aug. 8.4	53.505	79	22.06	100	10.399	253	84.75	237	12.419	106	58.60	182	66.01	76	46.87	237
18.3	53.393	112	22.88	82	10.095	304	86.71	196	12.278	141	60.10	150	65.16	85	48.83	196
28.3	53.252	141	23.50	62	9.749	346	88.23	152	12.105	173	61.26	116	64.21	95	50.35	152
Sept. 7.3	53.089	163	23.95	45	9.371	378	89.27	104	11.910	195	62.06	80	63.20	101	51.40	105
17.3	52.913	176	24.20	25	8.972	399	89.81	54	11.698	212	62.51	45	62.14	106	51.94	54
27.2	52.732	181	24.26	6 —	8.564	408	89.82	1 —	11.481	217	62.56	5 —	61.06	108	51.97	3 —
Oct. 7.2	52.556	176	24.11	15	8.163	401	89.32	50	11.268	213	62.22	34	60.00	106	51.46	51
17.2	52.395	161	23.77	34	7.778	385	88.30	102	11.067	201	61.49	73	58.97	103	50.44	102
27.1	52.257	138	23.22	55	7.425	353	86.77	153	10.889	178	60.38	111	58.00	97	48.92	152
Nov. 6.1	52.152	105	22.45	77	7.117	308	84.76	201	10.744	145	58.90	148	57.12	88	46.92	200
16.1	52.086	66	21.49	96	6.864	253	82.30	246	10.639	105	57.08	182	56.37	75	44.47	245
26.1	52.063	23 —	20.33	116	6.677	187	79.46	284	10.579	60	54.95	213	55.75	62	41.64	283
Dec. 6.0	52.087	24	19.01	132	6.561	116	76.30	316	10.567	12 —	52.57	238	55.30	45	38.49	315
16.0	52.158	71	17.54	147	6.523	38 —	72.91	339	10.605	38	49.98	259	55.03	27	35.12	337
26.0	52.274	116	15.97	157	6.563	40	69.38	353	10.692	87	47.28	270	54.94	9 —	31.61	351
36.0	52.430	156	14.34	163	6.681	118	65.86	352	10.826	134	44.55	273	55.04	10	28.10	351
Mean Place	49.827		12.40		7.760		66.02		9.152		43.38		64.420		27.99	
Sec δ, Tan δ	1.001		+0.048		1.830		+1.533		1.113		+0.489		4.437		+4.323	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		0.00		+0.02		0.00		+0.05		0.00		−0.05		+0.01	
$D_\psi \delta$, $D_\omega \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**θ Herculis.** Mag. 4.0				**ν Ophiuchi.** Mag. 3.5				**ξ Herculis.** Mag. 3.8				**γ Draconis.** Mag. 2.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 53		+37 15		17 54		− 9 45		17 54		+29 15		17 54		+51 29	
	s		″		s		″		s		″		s		″	
Jan. 1.0	27.503		37.42		33.758		50.72		36.294		20.99		41.819		51.70	
10.9	27.662	159	34.36	306	33.941	183	51.59	87	36.453	159	18.19	280	41.978	159	48.31	339
20.9	27.867	205	31.44	292	34.159	218	52.46	87	36.653	200	15.53	266	42.197	219	45.09	322
30.9	28.111	244	28.79	265	34.403	244	53.29	83	36.887	234	13.09	244	42.470	273	42.17	292
Feb. 9.9	28.386	275	26.51	228	34.669	266	54.02	73	37.150	263	10.99	210	42.789	319	39.66	251
19.8	28.688	302	24.69	182	34.950	281	54.63	61	37.434	284	9.31	168	43.145	356	37.65	201
Mar. 1.8	29.007	319	23.39	130	35.241	291	55.07	44	37.735	301	8.11	120	43.526	381	36.23	142
11.8	29.336	329	22.67	72	35.537	296	55.31	24	38.043	308	7.43	68	43.925	399	35.43	80
21.8	29.669	333	22.54	13	35.834	297	55.35	4	38.354	311	7.30	13	44.328	403	35.28	15
31.7	29.998	329	23.02	48	36.129	295	55.17	18	38.662	308	7.73	43	44.726	398	35.80	52
Apr. 10.7	30.317	319	24.06	104	36.417	288	54.80	37	38.960	298	8.69	96	45.111	385	36.93	113
20.7	30.618	301	25.63	157	36.696	279	54.25	55	39.246	286	10.12	143	45.472	361	38.64	171
30.6	30.899	281	27.65	202	36.961	265	53.55	70	39.512	266	11.96	184	45.803	331	40.85	221
May 10.6	31.150	251	30.05	240	37.208	247	52.74	81	39.755	243	14.17	221	46.095	292	43.49	264
20.6	31.369	219	32.75	270	37.433	225	51.86	88	39.968	213	16.65	248	46.341	246	46.44	295
30.6	31.551	182	35.65	290	37.631	198	50.93	93	40.149	181	19.31	266	46.537	196	49.65	321
June 9.5	31.692	141	38.68	303	37.799	168	50.01	92	40.293	144	22.08	277	46.677	140	52.98	333
19.5	31.788	96	41.72	304	37.932	133	49.11	90	40.397	104	24.87	279	46.760	83	56.34	336
29.5	31.837	49	44.72	300	38.029	97	48.26	85	40.458	61	27.61	274	46.783	23	59.66	332
July 9.4	31.837	0	47.59	287	38.084	55	47.49	77	40.475	17	30.23	262	46.746	37	62.84	318
19.4	31.790	47	50.25	266	38.098	14	46.81	68	40.448	27	32.67	244	46.648	98	65.80	296
29.4	31.697	93	52.66	241	38.072	26	46.21	60	40.378	70	34.86	219	46.494	154	68.48	268
Aug. 8.4	31.560	137	54.76	210	38.005	67	45.71	50	40.266	112	36.78	192	46.288	206	70.83	235
18.3	31.385	175	56.50	174	37.903	102	45.30	41	40.118	148	38.37	159	46.036	252	72.77	194
28.3	31.176	209	57.87	137	37.771	132	44.97	33	39.939	179	39.61	124	45.744	292	74.29	152
Sept. 7.3	30.944	232	58.82	95	37.614	157	44.74	23	39.735	204	40.47	86	45.423	321	75.35	106
17.3	30.694	250	59.31	49	37.441	173	44.58	16	39.515	220	40.95	48	45.082	341	75.91	56
27.2	30.437	257	59.36	5	37.262	179	44.49	9	39.289	226	41.02	7	44.732	350	75.97	6
Oct. 7.2	30.183	254	58.96	40	37.086	176	44.48	1	39.065	224	40.68	34	44.386	346	75.52	45
17.2	29.944	239	58.11	85	36.924	162	44.56	8	38.856	209	39.93	75	44.057	329	74.55	97
27.1	29.730	214	56.80	131	36.784	140	44.73	17	38.668	188	38.77	116	43.756	301	73.09	146
Nov. 6.1	29.549	181	55.07	173	36.677	107	45.00	27	38.514	154	37.23	154	43.494	262	71.15	194
16.1	29.411	138	52.95	212	36.609	68	45.37	37	38.399	115	35.33	190	43.283	211	68.78	237
26.1	29.321	90	50.47	248	36.585	24	45.86	49	38.329	70	33.10	223	43.129	154	66.02	276
Dec. 6.0	29.284	37	47.71	276	36.608	23	46.46	60	38.309	20	30.61	249	43.040	89	62.94	308
16.0	29.302	18	44.72	299	36.678	70	47.18	72	38.340	31	27.91	270	43.019	21	59.64	330
26.0	29.375	73	41.62	310	36.793	115	47.98	80	38.422	82	25.09	282	43.068	49	56.20	344
36.0	29.501	126	38.50	312	36.951	158	48.84	86	38.552	130	22.24	285	43.184	116	52.74	346
Mean Place	28.491		37.78		33.998		53.13		37.040		20.91		43.502		52.38	
Sec δ, Tan δ	1.256		+0.761		1.015		−0.172		1.146		+0.560		1.606		+1.257	
$D_{\psi}a$, $D_{\omega}a$	+0.04		0.00		+0.07		0.00		+0.05		0.00		+0.03		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	67 Ophiuchi. Mag. 3.9				θ Aræ. Mag. 3.9				γ Sagittarii. Mag. 3.1				70 Ophiuchi. Mag. 4.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 17 56		° ′ + 2 55		h m 18 0		° ′ −50 5		h m 18 0		° ′ −30 25		h m 18 1		° ′ + 2 30	
	s		″		s		″		s		″		s		″	
Jan. 1.0	34.985		65.64		18.989		49.88		35.930		31.07		21.296		63.67	
10.9	35.156	171	64.06	158	19.249	260	48.33	155	36.137	207	30.67	40	21.464	168	62.10	157
20.9	35.361	205	62.52	154	19.562	313	46.93	140	36.382	245	30.34	33	21.665	201	60.57	153
30.9	35.593	232	61.10	142	19.919	357	45.72	121	36.658	276	30.10	24	21.894	229	59.14	143
Feb. 9.9	35.847	254	59.87	123	20.311	392	44.70	102	36.960	302	29.91	19	22.146	252	57.90	124
19.8	36.117	270	58.86	101	20.728	417	43.89	81	37.279	319	29.77	14	22.414	268	56.88	102
Mar. 1.8	36.398	281	58.14	72	21.163	435	43.30	59	37.610	331	29.65	12	22.694	280	56.15	73
11.8	36.685	287	57.74	40	21.610	447	42.92	38	37.948	338	29.56	9	22.980	286	55.72	43
21.8	36.974	289	57.66	8 —	22.059	449	42.76	16 —	38.289	341	29.47	9	23.269	289	55.63	9 —
31.7	37.261	287	57.94	28	22.504	445	42.80	4	38.628	339	29.40	7	23.557	288	55.87	24
Apr. 10.7	37.541	280	58.54	60	22.942	438	43.05	25	38.961	333	29.34	6	23.839	282	56.42	55
20.7	37.812	271	59.41	87	23.365	423	43.49	44	39.284	323	29.29	5	24.111	272	57.27	85
30.6	38.068	256	60.55	114	23.766	401	44.13	64	39.592	308	29.28	1 —	24.370	259	58.37	110
May 10.6	38.307	239	61.88	133	24.141	375	44.95	82	39.881	289	29.31	3	24.612	242	59.66	129
20.6	38.523	216	63.36	148	24.481	340	45.94	99	40.145	264	29.40	9	24.832	220	61.10	144
30.6	38.713	190	64.94	158	24.781	300	47.10	116	40.380	235	29.55	15	25.027	195	62.64	154
June 9.5	38.872	159	66.55	161	25.033	252	48.38	128	40.581	201	29.79	24	25.190	163	64.22	158
19.5	38.996	124	68.16	161	25.233	200	49.77	139	40.742	161	30.08	29	25.320	130	65.79	157
29.5	39.084	88	69.72	156	25.374	141	51.23	146	40.860	118	30.43	35	25.414	94	67.31	152
July 9.5	39.133	49	71.19	147	25.455	81	52.71	148	40.932	72	30.84	41	25.467	53	68.75	144
19.4	39.141	8 —	72.53	134	25.473	18 —	54.17	146	40.957	25 —	31.27	43	25.479	12 —	70.06	131
29.4	39.109	32	73.73	120	25.427	46	55.57	140	40.935	22	31.71	44	25.452	27	71.22	116
Aug. 8.4	39.038	71	74.77	104	25.322	105	56.84	127	40.866	69	32.14	43	25.386	66	72.22	100
18.3	38.932	106	75.63	86	25.161	161	57.92	108	40.755	111	32.52	38	25.284	102	73.05	83
28.3	38.798	134	76.30	67	24.952	209	58.78	86	40.608	147	32.82	30	25.153	131	73.69	64
Sept. 7.3	38.638	160	76.78	48	24.706	246	59.37	59	40.432	176	33.01	19	24.996	157	74.15	46
17.3	38.464	174	77.06	28	24.435	271	59.67	30 —	40.238	194	33.10	9 —	24.824	172	74.40	25
27.2	38.283	181	77.16	10 —	24.153	282	59.65	2	40.034	204	33.05	5	24.643	181	74.47	7 —
Oct. 7.2	38.104	179	77.05	11	23.874	279	59.29	36	39.833	201	32.86	19	24.464	179	74.34	13
17.2	37.939	165	76.72	33	23.614	260	58.60	69	39.646	187	32.55	31	24.298	166	74.00	34
27.2	37.795	144	76.20	52	23.387	227	57.62	98	39.485	161	32.13	42	24.152	146	73.47	53
Nov. 6.1	37.682	113	75.46	74	23.207	180	56.37	125	39.361	124	31.61	52	24.037	115	72.73	74
16.1	37.606	76	74.53	93	23.085	122	54.91	146	39.280	81	31.03	58	23.959	78	71.80	93
26.1	37.573	33 —	73.40	113	23.029	56 —	53.28	163	39.249	31 —	30.42	61	23.923	36 —	70.68	112
Dec. 6.0	37.586	13	72.10	130	23.042	13	51.57	171	39.271	22	29.81	61	23.931	8	69.39	129
16.0	37.644	58	70.66	144	23.128	86	49.84	173	39.347	76	29.24	57	23.986	55	67.96	143
26.0	37.747	103	69.12	154	23.283	155	48.13	171	39.474	127	28.72	52	24.086	100	66.43	153
36.0	37.891	144	67.53	159	23.502	219	46.52	161	39.650	176	28.28	44	24.227	141	64.85	158
Mean Place	35.312		64.02		19.506		54.85		36.186		34.86		21.623		61.86	
Sec δ, Tan δ	1.001		+0.051		1.559		−1.196		1.160		−0.587		1.001		+0.044	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		0.00		+0.09		0.00		+0.08		0.00		+0.06		0.00	
$D_\psi\delta$, $D_\omega\delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	72 Ophiuchi. Mag. 3.7				*o* Herculis. Mag. 3.8				μ Sagittarii. Mag. 4.0				η Sagittarii. Mag. 3.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 18 3		° ′ + 9 32		h m 18 4		° ′ +28 44		h m 18 8		° ′ −21 4		h m 18 12		° ′ −36 47	
	s		″		s		″		s		″		s		″	
Jan. 1.0	30.132	160	66.72	191	22.196	149	62.51	278	54.878	183	49.12	12	8.494	206	9.42	85
11.0	30.292	194	64.81	185	22.345	189	59.73	265	55.061	219	49.24	16	8.700	248	8.57	76
20.9	30.486	224	62.96	169	22.534	226	57.08	244	55.280	250	49.40	17	8.948	283	7.81	66
30.9	30.710	247	61.27	149	22.760	255	54.64	212	55.530	273	49.57	17	9.231	313	7.15	57
Feb. 9.9	30.957	266	59.78	120	23.015	277	52.52	171	55.803	290	49.74	12	9.544	333	6.58	48
19.8	31.223	278	58.58	86	23.292	294	50.81	125	56.093	304	49.86	7	9.877	350	6.10	39
Mar. 1.8	31.501	285	57.72	48	23.586	306	49.56	72	56.397	311	49.93	— 1	10.227	358	5.71	31
11.8	31.786	288	57.24	10	23.892	309	48.84	18	56.708	314	49.92	11	10.585	364	5.40	23
21.8	32.074	288	57.14	— 31	24.201	308	48.66	— 37	57.022	315	49.81	20	10.949	363	5.17	16
31.7	32.362	282	57.45	69	24.509	301	49.03	89	57.337	310	49.61	27	11.312	360	5.01	8
Apr. 10.7	32.644	273	58.14	104	24.810	290	49.92	138	57.647	301	49.34	35	11.672	349	4.93	0
20.7	32.917	258	59.18	133	25.100	273	51.30	181	57.948	290	48.99	39	12.021	336	4.93	9
30.7	33.175	241	60.51	159	25.373	249	53.11	217	58.238	274	48.60	42	12.357	317	5.02	21
May 10.6	33.416	218	62.10	176	25.622	222	55.28	244	58.512	251	48.18	41	12.674	291	5.23	30
20.6	33.634	193	63.86	191	25.844	191	57.72	265	58.763	224	47.77	40	12.965	260	5.53	40
30.6	33.827	160	65.77	196	26.035	153	60.37	276	58.987	194	47.37	35	13.225	225	5.93	51
June 9.5	33.987	126	67.73	197	26.188	114	63.13	279	59.181	158	47.02	29	13.450	184	6.44	61
19.5	34.113	89	69.70	193	26.302	72	65.92	276	59.339	118	46.73	21	13.634	137	7.05	70
29.5	34.202	49	71.63	182	26.374	27	68.68	263	59.457	76	46.52	16	13.771	90	7.75	74
July 9.5	34.251	8	73.45	168	26.401	— 17	71.31	248	59.533	31	46.36	10	13.861	37	8.49	78
19.4	34.259	— 34	75.13	153	26.384	62	73.79	225	59.564	— 13	46.26	3	13.898	— 15	9.27	78
29.4	34.225	72	76.66	133	26.322	103	76.04	196	59.551	57	46.23	0	13.883	65	10.05	74
Aug. 8.4	34.153	107	77.99	110	26.219	140	78.00	166	59.494	95	46.23	3	13.818	112	10.79	66
18.4	34.046	138	79.09	87	26.079	174	79.66	131	59.399	131	46.26	4	13.706	153	11.45	57
28.3	33.908	163	79.96	63	25.905	199	80.97	95	59.268	159	46.30	3	13.553	185	12.02	41
Sept. 7.3	33.745	179	80.59	38	25.706	217	81.92	56	59.109	178	46.33	0	13.368	209	12.43	24
17.3	33.566	187	80.97	11	25.489	224	82.48	16	58.931	187	46.33	3	13.159	220	12.67	5
27.2	33.379	185	81.08	— 14	25.265	224	82.64	— 26	58.744	187	46.30	7	12.939	221	12.72	— 16
Oct. 7.2	33.194	174	80.94	40	25.041	211	82.38	66	58.557	174	46.23	11	12.718	206	12.56	35
17.2	33.020	152	80.54	68	24.830	190	81.72	106	58.383	152	46.12	14	12.512	183	12.21	53
27.2	32.868	124	79.86	92	24.640	160	80.66	146	58.231	120	45.98	14	12.329	145	11.68	71
Nov. 6.1	32.744	86	78.94	118	24.480	121	79.20	181	58.111	80	45.84	14	12.184	101	10.97	83
16.1	32.658	46	77.76	140	24.359	77	77.39	215	58.031	35	45.70	12	12.083	47	10.14	91
26.1	32.612	0	76.36	162	24.282	29	75.24	242	57.996	— 13	45.58	7	12.036	— 7	9.23	97
Dec. 6.1	32.612	45	74.74	177	24.253	— 21	72.82	264	58.009	63	45.51	1	12.043	65	8.26	97
16.0	32.657	91	72.97	188	24.274	71	70.18	277	58.072	110	45.50	— 4	12.108	121	7.29	95
26.0	32.748	133	71.09	193	24.345	119	67.41	281	58.182	155	45.54	11	12.229	173	6.34	88
36.0	32.881		69.16		24.464		64.60		58.337		45.65		12.402		5.46	
Mean Place	30.534		65.20		22.938		61.71		55.117		52.30		8.815		13.33	
Sec δ, Tan δ	1.014		+0.168		1.141		+0.549		1.072		−0.385		1.249		−0.748	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.06		0.00		+0.05		0.00		+0.07		0.00		+0.08		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**Groombridge 2533.** Mag. 5.4				**36 Draconis.** Mag. 5.0				**δ Sagittarii.** Mag. 2.8				**η Serpentis.** Mag. 3.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 18 13 s		° ′ +42 7 ″		h m 18 13 s		° ′ +64 21 ″		h m 18 15 s		° ′ −29 51 ″		h m 18 17 s		° ′ − 2 55 ″	
Jan. 1.0	6.402		53.01		22.85		71.88		48.232		46.12		6.756		12.36	
11.0	6.534	132	49.82	319	22.97	12	68.37	351	48.420	188	45.67	45	6.911	155	13.57	121
20.9	6.719	185	46.77	305	23.19	22	64.99	338	48.649	229	45.28	39	7.100	189	14.75	118
30.9	6.949	230	43.94	283	23.50	31	61.89	310	48.910	261	44.95	33	7.320	220	15.85	110
Feb. 9.9	7.218	269	41.46	248	23.89	39	59.16	273	49.198	288	44.66	29	7.562	242	16.82	97
19.8	7.518	300	39.42	204	24.34	45	56.91	225	49.506	308	44.41	25	7.823	261	17.60	78
Mar. 1.8	7.842	324	37.95	147	24.84	50	55.24	167	49.828	322	44.17	24	8.097	274	18.16	56
11.8	8.182	340	37.05	90	25.37	53	54.20	104	50.160	332	43.95	22	8.380	283	18.45	29
21.8	8.530	348	36.74	31 —	25.91	54	53.83	37 —	50.497	337	43.73	22	8.668	288	18.47	2 —
31.7	8.879	349	37.05	31	26.47	56	54.13	30	50.834	337	43.51	22	8.958	290	18.21	26
Apr. 10.7	9.221	342	37.98	93	27.00	53	55.09	96	51.168	334	43.30	21	9.244	286	17.69	52
20.7	9.549	328	39.45	147	27.50	50	56.65	156	51.496	328	43.11	19	9.524	280	16.91	78
30.7	9.856	307	41.43	198	27.96	46	58.76	211	51.810	314	42.95	16	9.793	269	15.94	97
May 10.6	10.137	281	43.82	239	28.37	41	61.35	259	52.106	296	42.83	12	10.046	253	14.79	115
20.6	10.382	245	46.56	274	28.71	34	64.31	296	52.382	276	42.78	5 —	10.281	235	13.54	125
30.6	10.589	207	49.56	300	28.98	27	67.54	323	52.629	247	42.81	3	10.490	209	12.21	133
June 9.5	10.752	163	52.71	315	29.17	19	70.96	342	52.842	213	42.91	10	10.671	181	10.85	136
19.5	10.868	116	55.92	321	29.27	10	74.48	352	53.019	177	43.11	20	10.817	146	9.52	133
29.5	10.934	66	59.11	319	29.29	2 —	77.97	349	53.152	133	43.38	27	10.927	110	8.24	128
July 9.5	10.947	13 —	62.18	307	29.22	7	81.35	338	53.241	89	43.72	34	10.997	70	7.05	119
19.4	10.909	38	65.11	293	29.06	16	84.56	321	53.281	40 —	44.12	40	11.025	28 —	5.96	109
29.4	10.819	90	67.77	266	28.82	24	87.51	295	53.274	7	44.54	42	11.012	13	5.01	95
Aug. 8.4	10.682	137	70.13	236	28.51	31	90.13	262	53.219	55	44.97	43	10.959	53	4.19	82
18.4	10.501	181	72.14	201	28.14	37	92.37	224	53.121	98	45.38	41	10.869	90	3.52	67
28.3	10.282	219	73.76	162	27.70	44	94.19	182	52.985	136	45.73	35	10.745	124	3.00	52
Sept. 7.3	10.033	249	74.96	120	27.22	48	95.54	135	52.816	169	46.00	27	10.595	150	2.62	38
17.3	9.764	269	75.70	74	26.71	51	96.39	85	52.627	189	46.15	15	10.425	170	2.40	22
27.2	9.484	580	75.98	28 —	26.18	53	96.73	34 —	52.425	202	46.20	5 —	10.245	180	2.30	10 —
Oct. 7.2	9.203	281	75.77	21	25.65	53	96.53	20	52.223	202	46.11	9	10.066	179	2.36	6
17.2	8.933	270	75.10	67	25.13	52	95.80	73	52.033	190	45.88	23	9.897	169	2.58	22
27.2	8.686	247	73.94	116	24.65	48	94.55	125	51.865	168	45.54	34	9.746	151	2.94	36
Nov. 6.1	8.470	216	72.32	162	24.22	43	92.77	178	51.731	134	45.11	43	9.623	123	3.44	50
16.1	8.295	175	70.28	204	23.84	38	90.53	224	51.637	94	44.59	52	9.537	86	4.11	67
26.1	8.168	127	67.84	244	23.53	31	87.85	268	51.592	45 —	44.03	56	9.489	48	4.92	81
Dec. 6.1	8.095	73	65.09	275	23.32	21	84.82	303	51.599	7	43.45	58	9.487	2 —	5.87	95
16.0	8.079	16 —	62.07	302	23.19	13	81.51	331	51.658	59	42.88	57	9.529	42	6.94	107
26.0	8.120	41	58.90	317	23.16	3 —	78.01	350	51.768	110	42.36	52	9.616	87	8.11	117
36.0	8.218	98	55.67	323	23.23	7	74.46	355	51.927	159	41.89	47	9.745	129	9.32	121
Mean Place	7.580		51.81		25.842		70.70		48.504		49.65		7.053		14.85	
Sec δ, Tan δ	1.348		+0.905		2.312		+2.084		1.153		−0.574		1.001		−0.051	
$D_\psi \alpha$, $D_\omega \alpha$	+0.04		0.00		+0.01		−0.01		+0.08		0.00		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**ε Sagittarii.** Mag. 2.0				**109 Herculis.** Mag. 3.9				**α Telescopii.** Mag. 3.8				**χ Draconis.** Mag. 3.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	18 18		−34 25		18 20		+21 43		18 20		−46 0		18 22		+72 41	
	s		″		s		″		s		″		s		″	
Jan. 1.0	47.407	194	22.88	74	14.160	135	56.59	247	57.592	217	48.15	144	26.30	11	54.88	350
11.0	47.601	234	22.14	66	14.295	176	54.12	239	57.809	268	46.71	133	26.41	24	51.38	341
20.9	47.835	271	21.48	60	14.471	209	51.73	220	58.077	310	45.38	120	26.65	37	47.97	316
30.9	48.106	299	20.88	52	14.680	237	49.53	195	58.387	345	44.18	107	27.02	50	44.81	282
Feb. 9.9	48.405	320	20.36	45	14.917	260	47.58	159	58.732	372	43.11	90	27.52	59	41.99	233
19.9	48.725	336	19.91	39	15.177	278	45.99	118	59.104	393	42.21	74	28.11	68	39.66	179
Mar. 1.8	49.061	346	19.52	34	15.455	289	44.81	71	59.497	406	41.47	59	28.79	73	37.87	117
11.8	49.407	354	19.18	30	15.744	296	44.10	23	59.903	413	40.88	41	29.52	77	36.70	50
21.8	49.761	354	18.88	23	16.040	298	43.87	— 28	60.316	415	40.47	23	30.29	77	36.20	— 16
31.7	50.115	351	18.65	18	16.338	295	44.15	76	60.731	413	40.24	8	31.06	76	36.36	81
Apr. 10.7	50.466	343	18.47	12	16.633	287	44.91	120	61.144	402	40.16	— 10	31.82	71	37.17	144
20.7	50.809	332	18.35	4	16.920	274	46.11	161	61.546	388	40.26	29	32.53	66	38.61	199
30.7	51.141	313	18.31	— 4	17.194	255	47.72	193	61.934	367	40.55	45	33.19	57	40.60	248
May 10.6	51.454	290	18.35	14	17.449	233	49.65	220	62.301	338	41.00	64	33.76	47	43.08	286
20.6	51.744	261	18.49	25	17.682	203	51.85	239	62.639	303	41.64	79	34.23	37	45.94	317
30.6	52.005	226	18.74	35	17.885	171	54.24	251	62.942	262	42.43	95	34.60	25	49.11	337
June 9.6	52.231	186	19.09	44	18.056	135	56.75	254	63.204	214	43.38	107	34.85	13	52.48	348
19.5	52.417	142	19.53	54	18.191	95	59.29	252	63.418	162	44.45	119	34.98	— 1	55.96	349
29.5	52.559	94	20.07	60	18.286	53	61.81	243	63.580	105	45.64	125	34.97	13	59.45	341
July 9.5	52.653	43	20.67	65	18.339	8	64.24	228	63.685	46	46.89	128	34.84	24	62.86	325
19.4	52.696	— 7	21.32	67	18.347	— 34	66.52	207	63.731	— 14	48.17	125	34.60	37	66.11	300
29.4	52.689	57	21.99	65	18.313	76	68.59	185	63.717	73	49.42	118	34.23	48	69.11	271
Aug. 8.4	52.632	103	22.64	61	18.237	114	70.44	156	63.644	126	50.60	107	33.75	57	71.82	235
18.4	52.529	142	23.25	51	18.123	147	72.00	126	63.518	174	51.67	90	33.18	65	74.17	193
28.3	52.387	177	23.76	40	17.976	176	73.26	95	63.344	214	52.57	68	32.53	71	76.10	148
Sept. 7.3	52.210	200	24.16	24	17.800	194	74.21	60	63.130	241	53.25	45	31.82	77	77.58	100
17.3	52.010	213	24.40	9	17.606	205	74.81	25	62.889	258	53.70	16	31.05	79	78.58	47
27.3	51.797	213	24.49	— 9	17.401	205	75.06	— 11	62.631	258	53.86	— 14	30.26	80	79.05	— 6
Oct. 7.2	51.584	202	24.40	27	17.196	197	74.95	47	62.373	247	53.72	42	29.46	78	78.99	58
17.2	51.382	179	24.13	44	16.999	179	74.48	83	62.126	219	53.30	71	28.68	75	78.41	112
27.2	51.203	145	23.69	58	16.820	151	73.65	119	61.907	181	52.59	95	27.93	69	77.29	163
Nov. 6.1	51.058	102	23.11	70	16.669	116	72.46	151	61.726	131	51.64	118	27.24	61	75.66	212
16.1	50.956	52	22.41	78	16.553	75	70.95	181	61.595	73	50.46	134	26.63	51	73.54	256
26.1	50.904	— 3	21.63	82	16.478	31	69.14	209	61.522	11	49.12	145	26.12	38	70.98	295
Dec. 6.1	50.907	56	20.81	84	16.447	— 16	67.05	228	61.511	— 56	47.67	151	25.74	27	68.03	324
16.0	50.963	111	19.97	81	16.463	63	64.77	243	61.567	118	46.16	152	25.47	13	64.79	344
26.0	51.074	161	19.16	77	16.526	108	62.34	250	61.685	178	44.64	147	25.34	— 2	61.35	354
36.0	51.235		18.39		16.634		59.84		61.863		43.17		25.36		57.81	
Mean Place	47.718		26.53		14.753		54.57		58.065		52.17		31.194		52.60	
Sec δ, Tan δ	1.212		−0.685		1.076		+0.399		1.440		−1.036		3.363		+3.211	
Dψα, Dωα	+0.08		0.00		+0.05		0.00		+0.09		+0.01		−0.02		−0.02	
Dωδ	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Sagittarii. Mag. 2.9				c Serpentis. Mag. 5.4				1 Aquilæ. Mag. 4.1				ζ Pavonis. Mag. 4.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	18 22		−25 27		18 25		− 2 2		18 30		− 8 17		18 33		−71 29	
	s		″		s		″		s		″		s		″	
Jan. 1.0	58.056		60.76		27.732		16.74		47.674		63.44		32.46		54.50	
11.0	58.230	174	60.56	20	27.880	148	17.95	121	47.822	148	64.27	83	32.80	34	51.72	278
20.9	58.443	213	60.40	16	28.063	183	19.15	120	48.004	182	65.09	82	33.26	46	49.09	263
30.9	58.688	245	60.26	14	28.274	211	20.25	110	48.218	214	65.86	77	33.83	57	46.66	243
Feb. 9.9	58.959	271	60.13	13	28.511	237	21.21	96	48.456	238	66.51	65	34.48	65	44.50	216
19.9	59.250	291	60.00	13	28.766	255	22.00	79	48.714	258	67.04	53	35.21	73	42.64	186
Mar. 1.8	59.557	307	59.84	16	29.037	271	22.53	53	48.987	273	67.38	34	36.00	79	41.12	152
11.8	59.873	316	59.64	20	29.318	281	22.81	28	49.271	284	67.51	13	36.82	82	39.97	115
21.8	60.195	322	59.39	25	29.605	287	22.79	— 2	49.562	291	67.43	— 8	37.66	84	39.20	77
31.7	60.520	325	59.11	28	29.895	290	22.50	29	49.856	294	67.11	32	38.52	86	38.81	39
Apr. 10.7	60.843	323	58.79	32	30.183	288	21.92	58	50.150	294	66.58	53	39.37	85	38.80	1
20.7	61.159	316	58.45	34	30.466	283	21.10	82	50.439	289	65.86	72	40.21	84	39.18	— 38
30.7	61.464	305	58.10	35	30.739	273	20.05	105	50.719	280	64.98	88	41.01	80	39.94	76
May 10.6	61.754	290	57.77	33	30.998	259	18.84	121	50.986	267	63.98	100	41.76	75	41.06	112
20.6	62.024	270	57.47	30	31.237	239	17.51	133	51.234	248	62.89	109	42.45	69	42.50	144
30.6	62.268	244	57.24	23	31.454	217	16.09	142	51.460	226	61.76	113	43.05	60	44.24	174
June 9.6	62.480	212	57.07	17	31.641	187	14.65	144	51.657	197	60.63	113	43.57	52	46.25	201
19.5	62.657	177	56.98	9	31.797	156	13.22	143	51.821	164	59.54	109	43.98	41	48.45	220
29.5	62.793	136	56.97	1	31.914	117	11.84	138	51.948	127	58.51	103	44.28	30	50.81	236
July 9.5	62.887	94	57.06	— 9	31.993	79	10.56	128	52.036	88	57.56	95	44.46	18	53.25	244
19.4	62.934	47	57.20	14	32.029	36	9.39	117	52.082	46	56.72	84	44.51	5	55.70	245
29.4	62.933	— 1	57.40	20	32.024	— 5	8.36	103	52.084	2	56.02	70	44.43	— 8	58.08	238
Aug. 8.4	62.887	46	57.65	25	31.977	47	7.46	90	52.045	— 39	55.42	60	44.23	20	60.32	224
18.4	62.798	89	57.89	24	31.893	84	6.73	73	51.966	79	54.94	48	43.92	31	62.32	200
28.3	62.671	127	58.12	23	31.775	118	6.15	58	51.851	115	54.58	36	43.50	42	64.02	170
Sept. 7.3	62.512	159	58.31	19	31.628	147	5.73	42	51.709	142	54.33	25	43.00	50	65.35	133
17.3	62.332	180	58.45	14	31.462	166	5.45	28	51.544	165	54.19	14	42.43	57	66.25	90
27.3	62.140	192	58.51	6	31.285	177	5.34	11	51.368	176	54.14	5	41.82	61	66.67	42
Oct. 7.2	61.945	195	58.49	— 2	31.106	179	5.38	— 4	51.188	180	54.18	— 4	41.21	61	66.59	— 8
17.2	61.761	184	58.38	11	30.936	170	5.57	19	51.016	172	54.31	13	40.61	60	65.99	60
27.2	61.597	164	58.19	19	30.783	153	5.93	36	50.863	153	54.54	23	40.06	55	64.90	109
Nov. 6.1	61.464	133	57.93	26	30.657	126	6.44	51	50.736	127	54.86	32	39.58	48	63.34	156
16.1	61.369	95	57.63	30	30.564	93	7.11	67	50.641	95	55.28	42	39.19	39	61.36	198
26.1	61.320	49	57.31	32	30.512	52	7.92	81	50.587	54	55.80	52	38.91	28	59.06	230
Dec. 6.1	61.320	0	56.98	33	30.503	9	8.89	97	50.577	10	56.42	62	38.76	15	56.48	258
16.0	61.370	50	56.68	30	30.538	— 35	9.98	109	50.612	— 35	57.15	73	38.76	0	53.73	275
26.0	61.469	99	56.42	26	30.617	79	11.13	115	50.691	79	57.93	78	38.88	12	50.91	282
36.0	61.614	145	56.21	21	30.738	121	12.36	123	50.813	122	58.77	84	39.14	26	48.09	282
Mean Place	58.317		64.03		28.038		19.41		47.949		66.32		34.472		58.69	
Sec δ, Tan δ	1.108		−0.476		1.001		−0.035		1.011		−0.146		3.151		−2.988	
$D_\psi a$, $D_\omega a$	+0.07		0.00		+0.06		0.00		+0.06		0.00		+0.14		+0.03	
$D_\psi \delta$, $D_\omega \delta$	0.0		−1.0		0.0		−1.0		+0.1		−1.0		+0.1		−1.0	

5934°—1919——30

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*β* **Ophiuchi.** Mag. 2.9				*ι*¹ **Scorpii.** Mag. 3.1				*μ* **Herculis.** Mag. 3.5				*ψ* **Draconis.** Mag. 4.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 39		+ 4 35		17 41		−40 5		17 43		+27 45		17 43		+72 11	
	s		″		s		″		s		″		s		″	
Jan. 1.0	27.917	185	61.41	172	54.848	250	44.04	88	16.565	171	61.34	278	17.78	22	18.10	348
10.9	28.102	218	59.69	164	55.098	292	43.16	73	16.736	210	58.56	263	18.00	35	14.62	327
20.9	28.320	244	58.05	152	55.390	324	42.43	57	16.946	242	55.93	239	18.35	47	11.35	293
30.9	28.564	265	56.53	133	55.714	351	41.86	43	17.188	270	53.54	206	18.82	57	8.42	248
Feb. 9.9	28.829	277	55.20	106	56.065	368	41.43	28	17.458	287	51.49	162	19.39	65	5.94	194
19.8	29.106	287	54.14	76	56.433	379	41.15	15	17.745	302	49.87	115	20.04	71	4.00	133
Mar. 1.8	29.393	290	53.38	44	56.812	383	41.00	3	18.047	307	48.72	62	20.75	75	2.67	68
11.8	29.683	289	52.94	7	57.195	382	40.97	— 8	18.354	308	48.10	8	21.50	75	1.99	— 2
21.7	29.972	283	52.87	— 29	57.577	378	41.05	20	18.662	302	48.02	— 48	22.25	73	2.01	67
31.7	30.255	275	53.16	61	57.955	366	41.25	29	18.964	292	48.50	97	22.98	70	2.68	130
Apr. 10.7	30.530	262	53.77	91	58.321	350	41.54	39	19.256	277	49.47	143	23.68	63	3.98	188
20.7	30.792	246	54.68	117	58.671	331	41.93	49	19.533	256	50.90	184	24.31	56	5.86	239
30.6	31.038	227	55.85	138	59.002	306	42.42	59	19.789	232	52.74	218	24.87	47	8.25	279
May 10.6	31.265	201	57.23	152	59.308	276	43.01	70	20.021	201	54.92	242	25.34	36	11.04	311
20.6	31.466	174	58.75	163	59.584	241	43.71	77	20.222	169	57.34	260	25.70	24	14.15	331
30.6	31.640	143	60.38	166	59.825	200	44.48	86	20.391	132	59.94	268	25.94	13	17.46	343
June 9.5	31.783	108	62.04	165	60.025	157	45.34	91	20.523	93	62.62	269	26.07	0	20.89	345
19.5	31.891	71	63.69	159	60.182	106	46.25	94	20.616	51	65.31	262	26.07	12	24.34	336
29.5	31.962	31	65.28	151	60.288	56	47.19	97	20.667	7	67.93	250	25.95	23	27.70	320
July 9.4	31.993	— 7	66.79	138	60.344	3	48.16	93	20.674	— 36	70.43	230	25.72	36	30.90	294
19.4	31.986	46	68.17	121	60.347	— 49	49.09	87	20.638	78	72.73	206	25.36	45	33.84	263
29.4	31.940	83	69.38	106	60.298	97	49.96	77	20.560	118	74.79	177	24.91	55	36.47	227
Aug. 8.4	31.857	116	70.44	87	60.201	140	50.73	63	20.442	152	76.56	146	24.36	60	38.74	184
18.3	31.741	144	71.31	67	60.061	180	51.36	46	20.290	181	78.02	111	23.76	71	40.58	139
28.3	31.597	165	71.98	47	59.881	209	51.82	25	20.109	204	79.13	73	23.05	75	41.97	89
Sept. 7.3	31.432	178	72.45	26	59.672	225	52.07	5	19.905	218	79.86	35	22.30	77	42.86	39
17.3	31.254	182	72.71	5	59.447	231	52.12	— 20	19.687	222	80.21	— 4	21.53	78	43.25	— 14
27.2	31.072	177	72.76	— 18	59.216	224	51.92	42	19.465	217	80.17	44	20.75	76	43.11	66
Oct. 7.2	30.895	160	72.58	39	58.992	204	51.50	65	19.248	202	79.73	85	19.99	72	42.45	119
17.2	30.735	137	72.19	62	58.788	171	50.85	83	19.046	177	78.88	124	19.27	68	41.26	169
27.1	30.598	104	71.57	83	58.617	128	50.02	99	18.869	145	77.64	161	18.59	61	39.57	217
Nov. 6.1	30.494	64	70.74	105	58.489	77	49.03	110	18.724	103	76.03	197	17.98	51	37.40	260
16.1	30.430	20	69.69	127	58.412	18	47.93	118	18.621	56	74.06	226	17.47	41	34.80	299
26.1	30.410	— 26	68.42	143	58.394	— 43	46.75	118	18.565	7	71.80	252	17.06	27	31.81	327
Dec. 6.0	30.436	73	66.99	159	58.437	105	45.57	114	18.558	— 44	69.28	271	16.79	14	28.54	349
16.0	30.509	119	65.40	169	58.542	163	44.43	105	18.602	95	66.57	282	16.65	1	25.05	358
26.0	30.628	159	63.71	172	58.705	216	43.38	95	18.697	142	63.75	283	16.64	— 13	21.47	357
36.0	30.787		61.99		58.921		42.43		18.839		60.92		16.77		17.90	
Mean Place	28.239		60.53		55.142		48.91		17.267		62.00		22.511		20.25	
Sec δ, Tan δ	1.003		+0.080		1.307		−0.842		1.130		+0.527		3.269		+3.113	
$D_\psi a$, $D_\omega a$	+0.06		0.00		+0.08		0.00		+0.05		0.00		−0.02		+0.01	
$D_\psi \delta$, $D_\omega \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Ophiuchi. Mag. 3.7				ξ Draconis. Mag. 3.9				89 Herculis. Mag. 5.5				35 Draconis. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 17 43		° ′ + 2 44		h m 17 52		° ′ +56 52		h m 17 52		° ′ +26 3		h m 17 52		° ′ +76 58	
	s		″		s		″		s		″		s		″	
Jan. 1.0	49.520	182	13.59	159	5.655	164	64.97	345	8.481	163	43.44	269	57.56	22	26.97	344
10.9	49.702	216	12.00	156	5.819	237	61.52	328	8.644	202	40.75	255	57.78	40	23.53	326
20.9	49.918	241	10.44	144	6.056	299	58.24	296	8.846	234	38.20	233	58.18	57	20.27	295
30.9	50.159	263	9.00	125	6.355	353	55.28	254	9.080	262	35.87	201	58.75	71	17.32	252
Feb. 9.9	50.422	276	7.75	102	6.708	395	52.74	202	9.342	281	33.86	161	59.46	83	14.80	201
19.8	50.698	286	6.73	73	7.103	425	50.72	141	9.623	295	32.25	114	60.29	92	12.79	141
Mar. 1.8	50.984	289	6.00	42	7.528	444	49.31	79	9.918	304	31.11	64	61.21	98	11.38	77
11.8	51.273	289	5.58	8	7.972	450	48.52	11	10.222	305	30.47	11	62.19	100	10.61	10
21.7	51.562	284	5.50	— 26	8.422	443	48.41	— 56	10.527	301	30.36	— 42	63.19	98	10.51	— 57
31.7	51.846	277	5.76	57	8.865	428	48.97	118	10.828	293	30.78	93	64.17	94	11.08	119
Apr. 10.7	52.123	265	6.33	85	9.293	398	50.15	177	11.121	279	31.71	139	65.11	87	12.27	177
20.7	52.388	248	7.18	111	9.691	361	51.92	228	11.400	260	33.10	180	65.98	76	14.04	228
30.6	52.636	230	8.29	129	10.052	315	54.20	271	11.660	238	34.90	212	66.74	62	16.32	271
May 10.6	52.866	205	9.58	145	10.367	261	56.91	304	11.898	210	37.02	237	67.36	49	19.03	306
20.6	53.071	180	11.03	153	10.628	203	59.95	327	12.108	178	39.39	257	67.85	34	22.09	325
30.6	53.251	148	12.56	157	10.831	137	63.22	339	12.286	144	41.96	265	68.19	16	25.34	340
June 9.5	53.399	113	14.13	156	10.968	73	66.61	344	12.430	104	44.61	267	68.35	1	28.74	344
19.5	53.512	76	15.69	151	11.041	3	70.05	338	12.534	62	47.28	261	68.36	— 16	32.18	338
29.5	53.588	38	17.20	142	11.044	— 66	73.43	323	12.596	19	49.89	249	68.20	33	35.56	323
July 9.4	53.626	— 1	18.62	130	10.978	131	76.66	301	12.615	— 24	52.38	232	67.87	48	38.79	300
19.4	53.625	41	19.92	114	10.847	195	79.67	271	12.591	66	54.70	208	67.39	62	41.79	271
29.4	53.584	79	21.06	100	10.652	253	82.38	237	12.525	106	56.78	182	66.77	76	44.50	237
Aug. 8.4	53.505	112	22.06	82	10.399	304	84.75	196	12.419	141	58.60	150	66.01	85	46.87	196
18.3	53.393	141	22.88	62	10.095	346	86.71	152	12.278	173	60.10	116	65.16	95	48.83	152
28.3	53.252	163	23.50	45	9.749	378	88.23	104	12.105	195	61.26	80	64.21	101	50.35	105
Sept. 7.3	53.089	176	23.95	25	9.371	399	89.27	54	11.910	212	62.06	45	63.20	106	51.40	54
17.3	52.913	181	24.20	6	8.972	408	89.81	1	11.698	217	62.51	5	62.14	108	51.94	3
27.2	52.732	176	24.26	— 15	8.564	401	89.82	— 50	11.481	213	62.56	— 34	61.06	106	51.97	— 51
Oct. 7.2	52.556	161	24.11	34	8.163	385	89.32	102	11.268	201	62.22	73	60.00	103	51.46	102
17.2	52.395	138	23.77	55	7.778	353	88.30	153	11.067	178	61.49	111	58.97	97	50.44	152
27.1	52.257	105	23.22	77	7.425	308	86.77	201	10.889	145	60.38	148	58.00	88	48.92	200
Nov. 6.1	52.152	66	22.45	96	7.117	253	84.76	246	10.744	105	58.90	182	57.12	75	46.92	245
16.1	52.086	23	21.49	116	6.864	187	82.30	284	10.639	60	57.08	213	56.37	62	44.47	283
26.1	52.063	— 24	20.33	132	6.677	116	79.46	316	10.579	12	54.95	238	55.75	45	41.64	315
Dec. 6.0	52.087	71	19.01	147	6.561	88 —	76.30	339	10.567	— 38	52.57	259	55.30	27	38.49	337
16.0	52.158	116	17.54	157	6.523	40	72.91	353	10.605	87	49.98	270	55.03	9	35.12	351
26.0	52.274	156	15.97	163	6.563	118	69.38	352	10.692	134	47.28	273	54.94	— 10	31.61	351
36.0	52.430		14.34		6.681		65.86		10.826		44.55		55.04		28.10	
Mean Place	49.827		12.40		7.760		66.02		9.152		43.38		64.420		27.99	
Sec δ, Tan δ	1.001		+0.048		1.830		+1.533		1.113		+0.489		4.437		+4.323	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		0.00		+0.02		0.00		+0.05		0.00		−0.05		+0.01	
$D_\psi\delta$, $D_\omega\delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*o* Draconis. Mag. 4.8				σ Sagittarii. Mag. 2.1				θ Serpentis *pr.* Mag. 4.5				R Lyræ. Var. 4.0–4.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 18 49		° ′ +59 17		h m 18 50		° ′ −26 23		h m 18 52		° ′ + 4 5		h m 18 52		° ′ +43 50	
	s		″		s		″		s		″		s		″	
Jan. 1.0	58.225	61	25.41	345	14.270	146	52.15	37	11.195	118	53.29	148	51.023	82	24.21	318
11.0	58.286	141	21.96	340	14.416	185	51.78	36	11.313	153	51.81	146	51.105	135	21.03	313
21.0	58.427	216	18.56	324	14.601	221	51.42	35	11.466	184	50.35	136	51.240	185	17.90	296
30.9	58.643	285	15.32	292	14.822	250	51.07	35	11.650	212	48.99	119	51.425	230	14.94	267
Feb. 9.9	58.928	345	12.40	251	15.072	273	50.72	37	11.862	235	47.80	97	51.655	270	12.27	229
19.9	59.273	395	9.89	201	15.345	292	50.35	40	12.097	254	46.83	70	51.925	303	9.98	180
Mar. 1.8	59.668	434	7.88	140	15.637	308	49.95	44	12.351	268	46.13	37	52.228	327	8.18	126
11.8	60.102	460	6.48	79	15.945	318	49.51	48	12.619	279	45.76	5	52.555	346	6.92	66
21.8	60.562	474	5.69	12	16.263	325	49.03	51	12.898	286	45.71	— 30	52.901	356	6.26	3
31.8	61.036	475	5.57	— 55	16.588	327	48.52	54	13.184	288	46.01	64	53.257	359	6.23	— 57
Apr. 10.7	61.511	464	6.12	117	16.915	325	47.98	55	13.472	287	46.65	94	53.616	352	6.80	117
20.7	61.975	439	7.29	176	17.240	320	47.43	54	13.759	281	47.59	123	53.968	340	7.97	171
30.7	62.414	403	9.05	227	17.560	307	46.89	50	14.040	271	48.82	145	54.308	318	9.68	218
May 10.7	62.817	358	11.32	272	17.867	291	46.39	44	14.311	253	50.27	163	54.626	289	11.86	259
20.6	63.175	304	14.04	306	18.158	266	45.95	37	14.564	232	51.90	174	54.915	253	14.45	290
30.6	63.479	240	17.10	331	18.424	239	45.58	25	14.796	205	53.64	181	55.168	212	17.35	313
June 9.6	63.719	172	20.41	348	18.663	203	45.33	16	15.001	173	55.45	182	55.380	165	20.48	326
19.5	63.891	99	23.89	353	18.866	164	45.17	5	15.174	137	57.27	177	55.545	114	23.74	331
29.5	63.990	26	27.42	350	19.030	120	45.12	— 6	15.311	98	59.04	170	55.659	61	27.05	328
July 9.5	64.016	— 51	30.92	340	19.150	73	45.18	16	15.409	56	60.74	156	55.720	5	30.33	316
19.5	63.965	124	34.32	321	19.223	25	45.34	26	15.465	13	62.30	143	55.725	— 50	33.49	296
29.4	63.841	196	37.53	294	19.248	— 24	45.60	30	15.478	— 30	63.73	124	55.675	103	36.45	271
Aug. 8.4	63.645	260	40.47	262	19.224	69	45.90	35	15.448	70	64.97	106	55.572	152	39.16	241
18.4	63.385	315	43.09	224	19.155	110	46.25	35	15.378	106	66.03	86	55.420	196	41.57	205
28.4	63.070	365	45.33	181	19.045	145	46.60	32	15.272	136	66.89	65	55.224	232	43.62	165
Sept. 7.3	62.705	402	47.14	135	18.900	173	46.92	28	15.136	161	67.54	44	54.992	262	45.27	121
17.3	62.303	425	48.49	85	18.727	188	47.20	20	14.975	174	67.98	22	54.730	280	46.48	76
27.3	61.878	436	49.34	33	18.539	196	47.40	11	14.801	181	68.20	2	54.450	288	47.24	27
Oct. 7.2	61.442	434	49.67	— 20	18.343	191	47.51	2	14.620	177	68.22	— 20	54.162	285	47.51	— 21
17.2	61.008	417	49.47	75	18.152	176	47.53	— 9	14.443	163	68.02	40	53.877	272	47.30	71
27.2	60.591	385	48.72	127	17.976	149	47.44	17	14.280	142	67.62	61	53.605	247	46.59	120
Nov. 6.2	60.206	342	47.45	179	17.827	114	47.27	27	14.138	111	67.01	82	53.358	212	45.39	167
16.1	59.864	286	45.66	226	17.713	72	47.00	31	14.027	75	66.19	100	53.146	171	43.72	210
26.1	59.578	222	43.40	269	17.641	27	46.69	35	13.952	35	65.19	118	52.975	121	41.62	249
Dec. 6.1	59.356	148	40.71	303	17.614	— 22	46.34	37	13.917	— 7	64.01	133	52.854	69	39.13	279
16.1	59.208	72	37.68	328	17.636	70	45.97	37	13.924	48	62.68	143	52.785	12	36.34	304
26.0	59.136	— 11	34.40	344	17.706	117	45.60	36	13.972	90	61.25	150	52.773	— 44	33.30	316
36.0	59.147		30.96		17.823		45.24		14.062		59.75		52.817		30.14	
Mean Place	60.506		20.47		14.554		55.10		11.546		49.86		52.240		19.51	
Sec δ, Tan δ	1.958		+1.684		1.116		−0.496		1.003		+0.072		1.386		+0.960	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.02		−0.02		+0.07		+0.01		+0.06		0.00		+0.04		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Lyræ. Mag. 3.3				ε Aquilæ. Mag. 4.2				ζ Sagittarii. Mag. 2.7				ζ Aquilæ. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 18 55		° ′ +32 34		h m 18 55		° ′ +14 57		h m 18 57		° ′ −29 59		h m 19 1		° ′ +13 44	
	s		″		s		″		s		″		s		″	
Jan. 1.0	53.968		43.93		56.279		30.16		27.214		47.57		40.765		35.71	
11.0	54.058	90	41.11	282	56.385	106	28.10	206	27.356	142	46.95	62	40.865	100	33.72	199
21.0	54.193	135	38.33	278	56.527	142	26.09	201	27.540	184	46.34	61	41.002	137	31.77	195
30.9	54.368	175	35.71	262	56.703	176	24.19	190	27.760	220	45.74	60	41.174	172	29.94	183
Feb. 9.9	54.581	213	33.33	238	56.910	207	22.50	169	28.011	251	45.15	59	41.376	202	28.30	164
19.9	54.824	243	31.32	201	57.141	231	21.09	141	28.287	276	44.56	59	41.602	226	26.93	137
Mar. 1.8	55.094	270	29.74	158	57.393	252	20.02	107	28.584	297	43.97	59	41.850	248	25.90	103
11.8	55.387	293	28.66	108	57.661	268	19.35	67	28.897	313	43.38	59	42.115	265	25.25	65
21.8	55.694	307	28.13	53	57.941	280	19.11	24	29.223	326	42.78	60	42.393	278	25.02	23
31.8	56.010	316	28.17	4	58.229	288	19.30	19	29.556	333	42.19	59	42.680	287	25.21	19
Apr. 10.7	56.329	319	28.76	59	58.521	292	19.93	63	29.893	337	41.60	59	42.971	291	25.83	62
20.7	56.645	316	29.88	112	58.810	289	20.96	103	30.229	336	41.04	56	43.262	291	26.85	102
30.7	56.951	306	31.49	161	59.094	284	22.35	139	30.560	331	40.53	51	43.547	285	28.21	136
May 10.7	57.242	291	33.52	203	59.366	272	24.07	172	30.881	321	40.09	44	43.822	275	29.90	169
20.6	57.511	269	35.91	239	59.620	254	26.03	196	31.184	303	39.73	36	44.080	258	31.82	192
30.6	57.751	240	38.59	268	59.852	232	28.19	216	31.465	281	39.49	24	44.317	237	33.94	212
June 9.6	57.957	206	41.45	286	60.056	204	30.46	227	31.716	251	39.36	13	44.525	208	36.17	223
19.5	58.123	166	44.42	297	60.226	170	32.78	232	31.932	216	39.36	0	44.701	176	38.44	227
29.5	58.247	124	47.42	300	60.360	134	35.10	232	32.108	176	39.48	12	44.841	140	40.71	227
July 9.5	58.324	77	50.38	296	60.453	93	37.34	224	32.239	131	39.74	26	44.940	99	42.91	220
19.5	58.353	29	53.22	284	60.503	50	39.45	211	32.322	83	40.10	36	44.996	56	44.99	208
29.4	58.334	19	55.88	266	60.509	6	41.41	196	32.354	32	40.54	44	45.009	13	46.91	192
Aug. 8.4	58.268	66	58.31	243	60.473	36	43.17	176	32.337	17	41.04	50	44.978	31	48.63	172
18.4	58.157	111	60.44	213	60.395	78	44.68	151	32.272	65	41.56	52	44.906	72	50.13	150
28.4	58.006	151	62.26	182	60.280	115	45.94	126	32.163	109	42.08	52	44.796	110	51.37	124
Sept. 7.3	57.822	184	63.71	145	60.135	145	46.93	99	32.018	145	42.55	47	44.656	140	52.35	98
17.3	57.611	211	64.78	107	59.964	171	47.62	69	31.842	176	42.95	40	44.490	166	53.05	70
27.3	57.384	227	65.42	64	59.779	185	48.03	41	31.648	194	43.25	30	44.308	182	53.46	41
Oct. 7.2	57.149	235	65.65	23	59.587	192	48.12	9	31.446	202	43.42	17	44.119	189	53.57	11
17.2	56.917	232	65.44	21	59.397	190	47.91	21	31.247	199	43.45	3	43.931	188	53.39	18
27.2	56.698	219	64.80	64	59.220	177	47.40	51	31.062	185	43.34	11	43.755	176	52.92	47
Nov. 6.2	56.501	197	63.72	108	59.066	154	46.57	83	30.904	158	43.09	25	43.601	154	52.14	78
16.1	56.335	166	62.25	147	58.940	126	45.46	111	30.779	125	42.73	36	43.474	127	51.09	105
26.1	56.207	128	60.37	188	58.849	91	44.08	138	30.697	82	42.27	46	43.381	93	49.77	132
Dec. 6.1	56.121	86	58.16	221	58.798	51	42.45	163	30.662	35	41.74	53	43.328	53	48.22	155
16.1	56.083	38	55.67	249	58.791	7	40.63	182	30.676	14	41.16	58	43.317	11	46.47	175
26.0	56.093	10	52.97	270	58.826	35	38.66	197	30.740	64	40.56	60	43.348	31	44.57	190
36.0	56.151	58	50.15	282	58.903	77	36.60	206	30.851	111	39.95	61	43.421	73	42.59	198
Mean Place	54.785		39.40		56.746		26.25		27.519		50.36		41.211		31.58	
Sec δ, Tan δ	1.187		+0.639		1.035		+0.267		1.155		−0.577		1.029		+0.245	
Dψα, Dωα	+0.04		−0.01		+0.05		0.00		+0.08		+0.01		+0.05		0.00	
Dψδ, Dωδ	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

Washington Mean Time.	λ Aquilæ. Mag. 3.6				α Coronæ Australis. Mag. 4.1				ι Lyræ. Mag. 5.1				π Sagittarii. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 19 1		° ′ − 5 0		h m 19 3		° ′ −38 1		h m 19 4		° ′ +35 58		h m 19 4		° ′ −21 9	
	s		″		s		″		s		″		s		″	
Jan. 1.0	56.731		14.27		57.336		53.04		23.804		26.00		56.582		9.61	
11.0	56.846	115	15.20	93	57.481	145	51.90	114	23.880	76	23.08	292	56.707	125	9.52	9
21.0	56.997	151	16.10	90	57.670	189	50.78	112	24.003	123	20.19	289	56.871	164	9.43	9
30.9	57.179	182	16.94	84	57.901	231	49.69	109	24.170	167	17.44	275	57.068	197	9.31	12
Feb. 9.9	57.389	210	17.65	71	58.168	267	48.63	106	24.377	207	14.95	249	57.294	226	9.15	16
19.9	57.621	232	18.20	55	58.463	295	47.64	99	24.618	241	12.81	214	57.546	252	8.91	24
Mar. 1.9	57.874	253	18.55	35	58.782	319	46.70	94	24.889	271	11.11	170	57.816	270	8.61	30
11.8	58.141	267	18.66	11 —	59.121	339	45.82	88	25.183	294	9.91	120	58.104	288	8.22	39
21.8	58.421	280	18.51	15	59.475	354	45.02	80	25.496	313	9.26	65	58.405	301	7.73	49
31.8	58.708	287	18.11	40	59.838	363	44.31	71	25.819	323	9.19	7 —	58.714	309	7.15	58
Apr. 10.7	59.001	293	17.46	65	60.206	368	43.68	63	26.148	329	9.70	51	59.028	314	6.49	66
20.7	59.293	292	16.59	87	60.575	369	43.16	52	26.475	327	10.78	108	59.343	315	5.75	74
30.7	59.581	288	15.51	108	60.938	363	42.77	39	26.793	318	12.36	158	59.654	311	4.99	76
May 10.7	59.861	280	14.30	121	61.290	352	42.52	25	27.095	302	14.39	203	59.956	302	4.22	77
20.6	60.125	264	12.98	132	61.625	335	42.43	9 —	27.376	281	16.80	241	60.244	288	3.47	75
30.6	60.370	245	11.59	139	61.935	310	42.50	7	27.627	251	19.52	272	60.511	267	2.78	69
June 9.6	60.588	218	10.18	141	62.214	279	42.75	25	27.843	216	22.45	293	60.752	241	2.16	62
19.6	60.777	189	8.80	138	62.454	240	43.16	41	28.020	177	25.53	308	60.961	209	1.64	52
29.5	60.929	152	7.49	131	62.650	196	43.72	56	28.152	132	28.65	312	61.131	170	1.22	42
July 9.5	61.042	113	6.27	122	62.797	147	44.43	71	28.236	84	31.72	307	61.261	130	0.93	29
19.5	61.113	71	5.17	110	62.891	94	45.24	81	28.270	34 —	34.70	298	61.345	84	0.77	16
29.4	61.140	27 —	4.21	96	62.931	40 —	46.14	90	28.253	17	37.52	282	61.382	37 —	0.71	6 —
Aug. 8.4	61.124	16	3.39	82	62.915	16	47.06	92	28.187	66	40.09	257	61.373	9	0.74	3
18.4	61.066	58	2.73	66	62.847	68	47.98	92	28.075	112	42.39	230	61.318	55	0.85	11
28.4	60.972	94	2.22	51	62.730	117	48.85	87	27.921	154	44.35	196	61.224	94	1.02	17
Sept. 7.3	60.844	128	1.86	36	62.572	158	49.62	77	27.731	190	45.95	160	61.093	131	1.22	20
17.3	60.692	152	1.64	22	62.382	190	50.24	62	27.513	218	47.15	120	60.933	160	1.43	21
27.3	60.522	170	1.54	10 —	62.168	214	50.70	46	27.276	237	47.93	78	60.756	177	1.62	19
Oct. 7.3	60.345	177	1.57	3	61.944	224	50.94	24	27.030	246	48.26	33 —	60.570	186	1.78	16
17.2	60.170	175	1.73	16	61.722	222	50.97	3 —	26.785	245	48.15	11	60.385	185	1.89	11
27.2	60.009	161	2.01	28	61.515	207	50.77	20	26.550	235	47.58	57	60.214	171	1.96	7
Nov. 6.2	59.867	142	2.41	40	61.333	182	50.36	41	26.338	212	46.55	103	60.065	149	1.97	1 —
16.1	59.756	111	2.92	51	61.188	145	49.76	60	26.154	184	45.10	145	59.947	118	1.95	2
26.1	59.679	77	3.55	63	61.088	100	48.97	79	26.008	146	43.24	186	59.867	80	1.91	4
Dec. 6.1	59.642	37 —	4.29	74	61.038	50 —	48.05	92	25.906	102	41.01	223	59.829	38 —	1.84	7
16.1	59.647	5	5.12	83	61.043	5	47.03	102	25.851	55	38.48	253	59.836	7	1.77	7
26.0	59.693	46	6.02	90	61.101	58	45.95	108	25.845	6 —	35.72	276	59.889	53	1.71	6
36.0	59.781	88	6.96	94	61.211	110	44.83	112	25.888	43	32.82	290	59.985	96	1.64	7
Mean Place	57.018		17.67		57.723		55.54		24.702		20.67		56.850		12.49	
Sec δ, Tan δ	1.004		−0.088		1.270		−0.782		1.236		+0.726		1.072		−0.387	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.06		0.00		+0.08		+0.01		+0.04		−0.01		+0.07		+0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ Sagittarii. Mag. 4.9				δ Draconis. Mag. 3.2				d Sagittarii. Mag. 5.0				θ Lyræ. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 19 10		° ′ −25 23		h m 19 12		° ′ +67 30		h m 19 12		° ′ −19 5		h m 19 13		° ′ +37 59	
	s		″		s		″		s		″		s		″	
Jan. 1.0	34.209		48.21		29.12		76.08		53.521		50.46		32.403		25.96	
11.0	34.332	123	47.84	37	29.10	2	72.66	342	53.636	115	50.48	2	32.466	63	23.01	295
21.0	34.495	163	47.45	39	29.19	9	69.21	345	53.789	153	50.49	1	32.578	112	20.06	295
30.9	34.693	198	47.05	40	29.38	19	65.87	334	53.975	186	50.45	4	32.735	157	17.24	282
Feb. 9.9	34.921	228	46.63	42	29.68	30	62.79	308	54.192	217	50.36	9	32.934	199	14.66	258
19.9	35.176	255	46.17	46	30.08	40	60.05	274	54.432	240	50.19	17	33.169	235	12.43	223
Mar. 1.9	35.452	276	45.66	51	30.54	46	57.78	227	54.695	263	49.92	27	33.438	269	10.62	181
11.8	35.745	293	45.10	56	31.07	53	56.07	171	54.974	279	49.54	38	33.733	295	9.32	130
21.8	36.053	308	44.49	61	31.64	57	54.96	111	55.266	292	49.05	49	34.047	314	8.58	74
31.8	36.370	317	43.82	67	32.25	61	54.53	43	55.570	304	48.44	61	34.376	329	8.42	16
Apr. 10.7	36.694	324	43.11	71	32.86	61	54.74	21	55.879	309	47.72	72	34.711	335	8.86	44
20.7	37.019	325	42.39	72	33.45	59	55.62	88	56.190	311	46.92	80	35.047	336	9.86	100
30.7	37.341	322	41.67	72	34.05	60	57.10	148	56.499	309	46.07	85	35.375	328	11.38	152
May 10.7	37.655	314	41.00	67	34.59	54	59.13	203	56.798	299	45.20	87	35.688	313	13.38	200
20.6	37.954	299	40.37	63	35.08	49	61.64	251	57.086	288	44.32	88	35.980	292	15.78	240
30.6	38.233	279	39.82	55	35.48	40	64.56	292	57.356	270	43.48	84	36.243	263	18.50	272
June 9.6	38.485	252	39.38	44	35.81	33	67.78	322	57.599	243	42.71	77	36.471	228	21.45	295
19.6	38.705	220	39.06	32	36.06	25	71.21	343	57.811	212	42.05	66	36.659	188	24.57	312
29.5	38.887	182	38.87	19	36.21	15	74.78	357	57.987	176	41.48	57	36.799	140	27.75	318
July 9.5	39.027	140	38.81	6	36.26	5	78.38	360	58.122	135	41.05	43	36.890	91	30.92	317
19.5	39.118	91	38.87	6	36.20	6	81.90	352	58.213	91	40.74	31	36.932	42	34.00	308
29.4	39.162	44	39.05	18	36.05	15	85.31	341	58.257	44	40.56	18	36.921	11	36.92	292
Aug. 8.4	39.159	3	39.32	27	35.81	24	88.50	319	58.255	2	40.48	8	36.860	61	39.63	271
18.4	39.109	50	39.65	33	35.48	33	91.39	289	58.209	46	40.50	2	36.751	109	42.04	241
28.4	39.016	93	40.02	37	35.07	41	93.95	256	58.121	88	40.59	9	36.597	154	44.13	209
Sept. 7.3	38.884	132	40.39	37	34.59	48	96.11	216	57.996	125	40.73	14	36.407	190	45.86	173
17.3	38.723	161	40.73	34	34.06	53	97.83	172	57.843	153	40.91	18	36.186	221	47.19	133
27.3	38.542	181	41.02	29	33.49	57	99.06	123	57.670	173	41.10	19	35.945	241	48.09	90
Oct. 7.3	38.350	192	41.23	21	32.90	59	99.78	72	57.487	183	41.27	17	35.693	252	48.55	46
17.2	38.159	191	41.36	13	32.30	60	99.97	19	57.305	182	41.42	15	35.439	254	48.53	2
27.2	37.979	180	41.39	3	31.71	59	99.60	37	57.134	171	41.54	12	35.195	244	48.06	47
Nov. 6.2	37.823	156	41.33	6	31.15	56	98.68	92	56.983	151	41.63	9	34.970	225	47.12	94
16.1	37.698	125	41.18	15	30.64	51	97.21	147	56.862	121	41.70	7	34.774	196	45.73	139
26.1	37.610	88	40.95	23	30.19	45	95.24	197	56.778	84	41.75	5	34.615	159	43.91	182
Dec. 6.1	37.566	44	40.68	27	29.81	38	92.80	244	56.733	45	41.79	4	34.498	117	41.71	220
16.1	37.568	2	40.37	31	29.52	29	89.97	283	56.733	0	41.83	4	34.427	71	39.18	253
26.0	37.617	49	40.04	33	29.34	18	86.81	316	56.776	43	41.87	4	34.407	20	36.42	276
36.0	37.710	93	39.70	34	29.25	9	83.44	337	56.863	87	41.91	4	34.436	29	33.49	293
Mean Place	34.489		50.89		32.458		68.50		53.780		53.38		33.349		19.84	
Sec δ, Tan δ	1.107		−0.475		2.616		+2.417		1.058		−0.346		1.269		+0.781	
Dψα, Dωα	+0.07		+0.01		0.00		−0.05		+0.07		+0.01		+0.04		−0.02	
Dψδ, Dωδ	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ω Aquilæ. Mag. 5.1				κ Cygni. Mag. 4.0				τ Draconis. Mag. 4.6				δ Aquilæ. Mag. 3.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 14		+11 26		19 15		+53 12		19 17		+73 12		19 21		+ 2 57	
	s		″		s		″		s		″		s		″	
Jan. 1.0	0.462		58.77		12.227		73.81		2.50		28.13		24.551		12.54	
11.0	0.552	90	56.94	183	12.260	33	70.51	330	2.42	8	24.74	339	24.641	90	11.21	133
21.0	0.680	128	55.14	180	12.361	101	67.20	331	2.48	6	21.31	343	24.768	127	9.90	131
30.9	0.841	161	53.45	169	12.524	163	64.00	320	2.70	22	17.96	335	24.927	159	8.68	122
Feb. 9.9	1.031	190	51.93	152	12.747	223	61.05	295	3.05	35	14.85	311	25.114	187	7.59	109
19.9	1.248	217	50.66	127	13.023	276	58.46	259	3.52	47	12.06	279	25.328	214	6.71	88
Mar. 1.9	1.488	240	49.70	96	13.346	323	56.33	213	4.10	58	9.74	232	25.564	236	6.10	61
11.8	1.746	258	49.10	60	13.707	361	54.74	159	4.77	67	7.94	180	25.819	255	5.78	32
21.8	2.018	272	48.90	20	14.098	391	53.76	98	5.50	73	6.75	119	26.087	268	5.77	1
31.8	2.301	283	49.10	20	14.506	408	53.42	34	6.29	79	6.20	55	26.367	280	6.10	33
Apr. 10.8	2.590	289	49.71	61	14.924	418	53.71	29	7.08	79	6.32	12	26.655	288	6.76	66
20.7	2.882	292	50.69	98	15.339	415	54.65	94	7.86	78	7.09	77	26.947	292	7.72	96
30.7	3.170	288	52.02	133	15.742	403	56.17	152	8.60	74	8.48	139	27.237	290	8.95	123
May 10.7	3.450	280	53.65	163	16.124	382	58.22	205	9.29	69	10.41	193	27.520	283	10.40	145
20.6	3.714	264	55.50	185	16.472	348	60.74	252	9.91	62	12.84	243	27.791	271	12.04	164
30.6	3.960	246	57.55	205	16.780	308	63.62	288	10.43	52	15.68	284	28.042	251	13.79	175
June 9.6	4.178	218	59.70	215	17.039	259	66.81	319	10.85	42	18.85	317	28.271	229	15.61	182
19.6	4.367	189	61.90	220	17.243	204	70.18	337	11.14	29	22.24	339	28.470	199	17.44	183
29.5	4.519	152	64.09	219	17.386	143	73.67	349	11.31	17	25.78	354	28.633	163	19.23	179
July 9.5	4.631	112	66.21	212	17.466	80	77.17	350	11.35	4	29.36	358	28.759	126	20.95	172
19.5	4.701	70	68.22	201	17.481	15	80.60	343	11.26	9	32.89	353	28.842	83	22.53	158
29.5	4.727	26	70.08	186	17.428	53	83.89	329	11.04	22	36.31	342	28.882	40	23.98	145
Aug. 8.4	4.709	18	71.74	166	17.313	115	86.95	306	10.70	34	39.54	323	28.878	4	25.26	128
18.4	4.649	60	73.19	145	17.139	174	89.73	278	10.25	45	42.49	295	28.834	44	26.33	107
28.4	4.552	97	74.40	121	16.910	229	92.17	244	9.69	56	45.12	263	28.749	85	27.22	89
Sept. 7.3	4.421	131	75.36	96	16.634	276	94.21	204	9.04	65	47.36	224	28.630	119	27.90	68
17.3	4.264	157	76.06	70	16.321	313	95.82	161	8.32	72	49.18	182	28.485	145	28.39	49
27.3	4.089	175	76.49	43	15.982	339	96.95	113	7.55	77	50.52	134	28.319	166	28.65	26
Oct. 7.3	3.904	185	76.64	15	15.627	355	97.59	64	6.75	80	51.35	83	28.144	175	28.73	8
17.2	3.720	184	76.52	12	15.270	357	97.70	11	5.94	81	51.65	30	27.968	176	28.60	13
27.2	3.546	174	76.12	40	14.922	348	97.29	41	5.13	81	51.40	25	27.801	167	28.27	33
Nov. 6.2	3.390	156	75.44	68	14.595	327	96.34	95	4.36	77	50.60	80	27.651	150	27.76	51
16.2	3.261	129	74.51	93	14.302	293	94.88	146	3.65	71	49.26	134	27.528	123	27.05	71
26.1	3.164	97	73.32	119	14.051	251	92.93	195	3.02	63	47.39	187	27.435	93	26.18	87
Dec. 6.1	3.105	59	71.92	140	13.852	199	90.54	239	2.47	55	45.05	234	27.379	56	25.14	104
16.1	3.086	19	70.32	160	13.713	139	87.78	276	2.04	43	42.28	277	27.363	16	23.95	119
26.0	3.108	22	68.58	174	13.636	77	84.71	307	1.74	30	39.19	309	27.387	24	22.67	128
36.0	3.170	62	66.76	182	13.626	10	81.45	326	1.57	17	35.87	332	27.450	63	21.33	134
Mean Place	0.868		54.23		13.906		66.67		7.262		19.82		24.869		8.31	
Sec δ, Tan δ	1.020		+0.203		1.670		+1.338		3.462		+3.314		1.001		+0.052	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		0.00		+0.03		−0.03		−0.02		−0.07		+0.06		0.00	
$D_\psi\delta$, $D_\omega\delta$	+0.1		−0.9		+0.1		−0.9		+0.1		−0.9		+0.1		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**β Cygni.** Mag. 3.2				**ι Cygni.** Mag. 3.9				**μ Aquilæ.** Mag. 4.6				**h Sagittarii.** Mag. 4.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 19 27		° ′ +27 47		h m 19 27		° ′ +51 33		h m 19 30		° ′ + 7 12		h m 19 31		° ′ −25 3	
	s		″		s		″		s		″		s		″	
Jan. 1.0	26.624		25.70		38.342		32.31		7.637		26.99		46.495		46.23	
11.0	26.685	61	23.16	254	38.360	18	29.08	323	7.715	78	25.43	156	46.595	100	45.83	40
21.0	26.787	102	20.61	255	38.442	82	25.81	327	7.830	115	23.90	153	46.733	138	45.39	44
31.0	26.928	141	18.17	244	38.586	144	22.63	318	7.977	147	22.45	145	46.909	176	44.92	47
Feb. 9.9	27.107	179	15.92	225	38.787	201	19.68	295	8.156	179	21.15	130	47.116	207	44.40	52
19.9	27.319	212	13.97	195	39.041	254	17.05	263	8.361	205	20.09	106	47.350	234	43.83	57
Mar. 1.9	27.558	239	12.41	156	39.341	300	14.86	219	8.589	228	19.30	79	47.610	260	43.20	63
11.8	27.822	264	11.29	112	39.681	340	13.19	167	8.838	249	18.82	48	47.889	279	42.48	72
21.8	28.106	284	10.66	63	40.051	370	12.10	109	9.103	265	18.70	12 —	48.184	295	41.72	76
31.8	28.404	298	10.56	10 —	40.444	393	11.66	44 —	9.381	278	18.95	25	48.495	311	40.90	82
Apr. 10.8	28.712	308	10.98	42	40.847	403	11.84	18	9.667	286	19.56	61	48.814	319	40.03	87
20.7	29.023	311	11.93	95	41.253	406	12.64	80	9.958	291	20.51	95	49.139	325	39.14	89
30.7	29.332	309	13.33	140	41.650	397	14.05	141	10.249	291	21.78	127	49.465	326	38.25	89
May 10.7	29.630	298	15.16	183	42.030	380	16.00	195	10.535	286	23.32	154	49.785	320	37.40	85
20.7	29.914	284	17.35	219	42.383	353	18.41	241	10.809	274	25.07	175	50.094	309	36.61	79
30.6	30.175	261	19.83	248	42.697	314	21.21	280	11.064	255	26.97	190	50.387	293	35.92	69
June 9.6	30.408	233	22.51	268	42.967	270	24.33	312	11.297	233	28.97	200	50.654	267	35.34	58
19.6	30.605	197	25.32	281	43.186	219	27.66	333	11.500	203	31.00	203	50.892	238	34.89	45
29.5	30.764	159	28.19	287	43.348	162	31.11	345	11.669	169	33.02	202	51.092	200	34.59	30
July 9.5	30.879	115	31.05	286	43.448	100	34.60	349	11.799	130	34.97	195	51.251	159	34.44	15
19.5	30.948	69	33.83	278	43.485	37 —	38.05	345	11.888	89	36.81	184	51.364	113	34.44	0
29.5	30.969	21 —	36.44	261	43.459	26	41.37	332	11.934	46	38.49	168	51.429	65	34.57	13
Aug. 8.4	30.943	26	38.87	243	43.369	90	44.49	312	11.935	1 —	40.00	151	51.445	16 —	34.82	25
18.4	30.872	71	41.04	217	43.221	148	47.34	285	11.893	42	41.31	131	51.413	32	35.16	34
28.4	30.759	113	42.94	190	43.019	202	49.87	253	11.812	81	42.39	108	51.336	77	35.55	39
Sept. 7.4	30.609	150	44.50	156	42.768	251	52.02	215	11.696	116	43.25	86	51.219	117	35.98	43
17.3	30.431	178	45.71	121	42.481	287	53.74	172	11.552	144	43.87	62	51.071	148	36.40	42
27.3	30.232	199	46.55	84	42.164	317	55.01	127	11.387	165	44.26	39	50.897	174	36.78	38
Oct. 7.3	30.019	213	47.01	46	41.830	334	55.79	78	11.211	176	44.40	14 —	50.711	186	37.10	32
17.2	29.804	215	47.06	5 —	41.491	339	56.06	27 —	11.033	178	44.31	9	50.521	190	37.33	23
27.2	29.597	207	46.70	36	41.157	334	55.80	26	10.862	171	43.98	33	50.339	182	37.47	14
Nov. 6.2	29.405	192	45.95	75	40.843	314	55.02	78	10.707	155	43.44	54	50.175	164	37.52	5 —
16.2	29.239	166	44.79	116	40.557	286	53.71	131	10.575	132	42.65	79	50.038	137	37.47	5
26.1	29.104	135	43.27	152	40.311	246	51.91	180	10.475	100	41.67	98	49.937	101	37.33	14
Dec. 6.1	29.006	98	41.42	185	40.112	199	49.67	224	10.410	65	40.48	119	49.875	62	37.10	23
16.1	28.950	56	39.27	215	39.968	144	47.02	265	10.383	27 —	39.13	135	49.857	18 —	36.83	27
26.1	28.937	13 —	36.91	236	39.883	85	44.06	296	10.396	13	37.66	147	49.884	27	36.51	32
36.0	28.968	31	34.38	253	39.860	23	40.89	317	10.448	52	36.11	155	49.953	69	36.15	36
Mean Place	27.264		19.31		39.862		24.13		7.976		22.16		46.764		48.62	
Sec δ, Tan δ	1.130		+0.527		1.609		+1.260		1.008		+0.126		1.104		−0.468	
$D_\psi a$, $D_\omega a$	+0.05		−0.01		+0.03		−0.03		+0.06		0.00		+0.07		+0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.1		−0.9		+0.1		−0.9		+0.2		−0.9		+0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Sagittarii. Mag. 2.0				109 Herculis. Mag. 3.9				α Telescopii. Mag. 3.8				χ Draconis. Mag. 3.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 18 18		° ′ −34 25		h m 18 20		° ′ +21 43		h m 18 20		° ′ −46 0		h m 18 22		° ′ +72 41	
	s		″		s		″		s		″		s		″	
Jan. 1.0	47.407		22.88		14.160		56.59		57.592		48.15		26.30		54.88	
11.0	47.601	194	22.14	74	14.295	135	54.12	247	57.809	217	46.71	144	26.41	11	51.38	350
20.9	47.835	234	21.48	66	14.471	176	51.73	239	58.077	268	45.38	133	26.65	24	47.97	341
30.9	48.106	271	20.88	60	14.680	209	49.53	220	58.387	310	44.18	120	27.02	37	44.81	316
Feb. 9.9	48.405	299	20.36	52	14.917	237	47.58	195	58.732	345	43.11	107	27.52	50	41.99	282
19.9	48.725	320	19.91	45	15.177	260	45.99	159	59.104	372	42.21	90	28.11	59	39.66	233
Mar. 1.8	49.061	336	19.52	39	15.455	278	44.81	118	59.497	393	41.47	74	28.79	68	37.87	179
11.8	49.407	346	19.18	34	15.744	289	44.10	71	59.903	406	40.88	59	29.52	73	36.70	117
21.8	49.761	354	18.88	30	16.040	296	43.87	23	60.316	413	40.47	41	30.29	77	36.20	50
31.7	50.115	354	18.65	23	16.338	298	44.15	— 28	60.731	415	40.24	23	31.06	77	36.36	— 16
Apr. 10.7	50.466	351	18.47	18	16.633	295	44.91	76	61.144	413	40.16	8	31.82	76	37.17	81
20.7	50.809	343	18.35	12	16.920	287	46.11	120	61.546	402	40.26	— 10	32.53	71	38.61	144
30.7	51.141	332	18.31	4	17.194	274	47.72	161	61.934	388	40.55	29	33.19	66	40.60	199
May 10.6	51.454	313	18.35	— 4	17.449	255	49.65	193	62.301	367	41.00	45	33.76	57	43.08	248
20.6	51.744	290	18.49	14	17.682	233	51.85	220	62.639	338	41.64	64	34.23	47	45.94	286
30.6	52.005	261	18.74	25	17.885	203	54.24	239	62.942	303	42.43	79	34.60	37	49.11	317
June 9.6	52.231	226	19.09	35	18.056	171	56.75	251	63.204	262	43.38	95	34.85	25	52.48	337
19.5	52.417	186	19.53	44	18.191	135	59.29	254	63.418	214	44.45	107	34.98	13	55.96	348
29.5	52.559	142	20.07	54	18.286	95	61.81	252	63.580	162	45.64	119	34.97	— 1	59.45	349
July 9.5	52.653	94	20.67	60	18.339	53	64.24	243	63.685	105	46.89	125	34.84	13	62.86	341
19.4	52.696	43	21.32	65	18.347	8	66.52	228	63.731	46	48.17	128	34.60	24	66.11	325
29.4	52.689	— 7	21.99	67	18.313	— 34	68.59	207	63.717	— 14	49.42	125	34.23	37	69.11	300
Aug. 8.4	52.632	57	22.64	65	18.237	76	70.44	185	63.644	73	50.60	118	33.75	48	71.82	271
18.4	52.529	103	23.25	61	18.123	114	72.00	156	63.518	126	51.67	107	33.18	57	74.17	235
28.3	52.387	142	23.76	51	17.976	147	73.26	126	63.344	174	52.57	90	32.53	65	76.10	193
Sept. 7.3	52.210	177	24.16	40	17.800	176	74.21	95	63.130	214	53.25	68	31.82	71	77.58	148
17.3	52.010	200	24.40	24	17.606	194	74.81	60	62.889	241	53.70	45	31.05	77	78.58	100
27.3	51.797	213	24.49	9	17.401	205	75.06	25	62.631	258	53.86	16	30.26	79	79.05	47
Oct. 7.2	51.584	213	24.40	— 9	17.196	205	74.95	— 11	62.373	258	53.72	— 14	29.46	80	78.99	— 6
17.2	51.382	202	24.13	27	16.999	197	74.48	47	62.126	247	53.30	42	28.68	78	78.41	58
27.2	51.203	179	23.69	44	16.820	179	73.65	83	61.907	219	52.59	71	27.93	75	77.29	112
Nov. 6.1	51.058	145	23.11	58	16.669	151	72.46	119	61.726	181	51.64	95	27.24	69	75.66	163
16.1	50.956	102	22.41	70	16.553	116	70.95	151	61.595	131	50.46	118	26.63	61	73.54	212
26.1	50.904	52	21.63	78	16.478	75	69.14	181	61.522	73	49.12	134	26.12	51	70.98	256
Dec. 6.1	50.907	— 3	20.81	82	16.447	31	67.05	209	61.511	11	47.67	145	25.74	38	68.03	295
16.0	50.963	56	19.97	84	16.463	— 16	64.77	228	61.567	— 56	46.16	151	25.47	27	64.79	324
26.0	51.074	111	19.16	81	16.526	63	62.34	243	61.685	118	44.64	152	25.34	13	61.35	344
36.0	51.235	161	18.39	77	16.634	108	59.84	250	61.863	178	43.17	147	25.36	— 2	57.81	354
Mean Place	47.718		26.53		14.753		54.57		58.065		52.17		31.194		52.60	
Sec δ, Tan δ	1.212		−0.685		1.076		+0.399		1.440		−1.036		3.363		+3.211	
$D_\psi \alpha$, $D_\omega \alpha$	+0.08		0.00		+0.05		0.00		+0.09		+0.01		−0.02		−0.02	
$D_\psi \delta$, $D_\omega \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

Washington Mean Time.	λ Sagittarii. Mag. 2.9				c Serpentis. Mag. 5.4				1 Aquilæ. Mag. 4.1				ζ Pavonis. Mag. 4.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 18 22		° ′ −25 27		h m 18 25		° ′ − 2 2		h m 18 30		° ′ − 8 17		h m 18 33		° ′ −71 29	
	s		″		s		″		s		″		s		″	
Jan. 1.0	58.056	174	60.76	20	27.732	148	16.74	121	47.674	148	63.44	83	32.46	34	54.50	278
11.0	58.230	213	60.56	16	27.880	183	17.95	120	47.822	182	64.27	82	32.80	46	51.72	263
20.9	58.443	245	60.40	14	28.063	211	19.15	110	48.004	214	65.09	77	33.26	57	49.09	243
30.9	58.688	271	60.26	13	28.274	237	20.25	96	48.218	238	65.86	65	33.83	65	46.66	216
Feb. 9.9	58.959	291	60.13	13	28.511	255	21.21	79	48.456	258	66.51	53	34.48	73	44.50	186
19.9	59.250	307	60.00	16	28.766	271	22.00	53	48.714	273	67.04	34	35.21	79	42.64	152
Mar. 1.8	59.557	316	59.84	20	29.037	281	22.53	28	48.987	284	67.38	13	36.00	82	41.12	115
11.8	59.873	322	59.64	25	29.318	287	22.81	— 2	49.271	291	67.51	— 8	36.82	84	39.97	77
21.8	60.195	325	59.39	28	29.605	290	22.79	29	49.562	294	67.43	32	37.66	86	39.20	39
31.7	60.520	323	59.11	32	29.895	288	22.50	58	49.856	294	67.11	53	38.52	85	38.81	1
Apr. 10.7	60.843	316	58.79	34	30.183	283	21.92	82	50.150	289	66.58	72	39.37	84	38.80	— 38
20.7	61.159	305	58.45	35	30.466	273	21.10	105	50.439	280	65.86	88	40.21	80	39.18	76
30.7	61.464	290	58.10	33	30.739	259	20.05	121	50.719	267	64.98	100	41.01	75	39.94	112
May 10.6	61.754	270	57.77	30	30.998	239	18.84	133	50.986	248	63.98	109	41.76	69	41.06	144
20.6	62.024	244	57.47	23	31.237	217	17.51	142	51.234	226	62.89	113	42.45	60	42.50	174
30.6	62.268	212	57.24	17	31.454	187	16.09	144	51.460	197	61.76	113	43.05	52	44.24	201
June 9.6	62.480	177	57.07	9	31.641	156	14.65	143	51.657	164	60.63	109	43.57	41	46.25	220
19.5	62.657	136	56.98	1	31.797	117	13.22	138	51.821	127	59.54	103	43.98	30	48.45	236
29.5	62.793	94	56.97	— 9	31.914	79	11.84	128	51.948	88	58.51	95	44.28	18	50.81	244
July 9.5	62.887	47	57.06	14	31.993	36	10.56	117	52.036	46	57.56	84	44.46	5	53.25	245
19.4	62.934	— 1	57.20	20	32.029	— 5	9.39	103	52.082	2	56.72	70	44.51	— 8	55.70	238
29.4	62.933	46	57.40	25	32.024	47	8.36	90	52.084	— 39	56.02	60	44.43	20	58.08	224
Aug. 8.4	62.887	89	57.65	24	31.977	84	7.46	73	52.045	79	55.42	48	44.23	31	60.32	200
18.4	62.798	127	57.89	23	31.893	118	6.73	58	51.966	115	54.94	36	43.92	42	62.32	170
28.3	62.671	159	58.12	19	31.775	147	6.15	42	51.851	142	54.58	25	43.50	50	64.02	133
Sept. 7.3	62.512	180	58.31	14	31.628	166	5.73	28	51.709	165	54.33	14	43.00	57	65.35	90
17.3	62.332	192	58.45	6	31.462	177	5.45	11	51.544	176	54.19	5	42.43	61	66.25	42
27.3	62.140	195	58.51	— 2	31.285	179	5.34	— 4	51.368	180	54.14	— 4	41.82	61	66.67	— 8
Oct. 7.2	61.945	184	58.49	11	31.106	170	5.38	19	51.188	172	54.18	13	41.21	60	66.59	60
17.2	61.761	164	58.38	19	30.936	153	5.57	36	51.016	153	54.31	23	40.61	55	65.99	109
27.2	61.597	133	58.19	26	30.783	126	5.93	51	50.863	127	54.54	32	40.06	48	64.90	156
Nov. 6.1	61.464	95	57.93	30	30.657	93	6.44	67	50.736	95	54.86	42	39.58	39	63.34	198
16.1	61.369	49	57.63	32	30.564	52	7.11	81	50.641	54	55.28	52	39.19	28	61.36	230
26.1	61.320	0	57.31	33	30.512	9	7.92	97	50.587	10	55.80	62	38.91	15	59.06	258
Dec. 6.1	61.320	50	56.98	30	30.503	— 35	8.89	109	50.577	— 35	56.42	73	38.76	0	56.48	275
16.0	61.370	99	56.68	26	30.538	79	9.98	115	50.612	79	57.15	78	38.76	12	53.73	282
26.0	61.469	145	56.42	21	30.617	121	11.13	123	50.691	122	57.93	84	38.88	26	50.91	282
36.0	61.614		56.21		30.738		12.36		50.813		58.77		39.14		48.09	
Mean Place	58.317		64.03		28.038		19.41		47.949		66.32		34.472		58.69	
Sec δ, Tan δ	1.108		−0.476		1.001		−0.035		1.011		−0.146		3.151		−2.988	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.07		0.00		+0.06		0.00		+0.06		0.00		+0.14		+0.03	
$D_{\psi}\delta$, $D_{\omega}\delta$	0.0		−1.0		0.0		−1.0		+0.1		−1.0		+0.1		−1.0	

5934°—1919——30

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Lyræ. (*Vega.*) Mag. 0.1				2 Aquilæ. Mag. 4.7				φ Sagittarii. Mag. 3.3				110 Herculis. Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	18 34		+38 42		18 37		− 9 7		18 40		−27 4		18 42		+20 27	
	s		″		s		″		s		″		s		″	
Jan. 1.0	10.722		30.11		50.116		49.11		35.478		27.68		9.918		67.47	
11.0	10.832	110	27.05	306	50.257	141	49.86	75	35.636	158	27.30	38	10.032	114	65.10	237
20.9	10.991	159	24.07	298	50.435	178	50.60	74	35.834	198	26.94	36	10.186	154	62.79	231
30.9	11.194	203	21.28	279	50.643	208	51.27	67	36.065	231	26.60	34	10.374	188	60.63	216
Feb. 9.9	11.436	242	18.80	248	50.876	233	51.86	59	36.325	260	26.27	33	10.593	219	58.71	192
19.9	11.710	274	16.73	207	51.131	255	52.31	45	36.607	282	25.94	33	10.836	243	57.11	160
Mar. 1.8	12.010	300	15.15	158	51.401	270	52.58	27	36.908	301	25.59	35	11.100	264	55.89	122
11.8	12.329	319	14.12	103	51.683	282	52.67	9	37.222	314	25.21	38	11.379	279	55.12	77
21.8	12.661	332	13.68	44	51.973	290	52.53	— 14	37.544	322	24.80	41	11.668	289	54.83	29
31.8	12.998	337	13.84	— 16	52.268	295	52.18	35	37.872	328	24.37	43	11.964	296	55.02	— 19
Apr. 10.7	13.333	335	14.59	75	52.563	295	51.63	55	38.201	329	23.91	46	12.260	296	55.68	66
20.7	13.660	327	15.89	130	52.855	292	50.88	75	38.526	325	23.45	46	12.552	292	56.80	112
30.7	13.971	311	17.70	181	53.139	284	49.99	89	38.844	318	23.01	44	12.835	283	58.31	151
May 10.6	14.261	290	19.95	225	53.410	271	48.98	101	39.148	304	22.60	41	13.103	268	60.16	185
20.6	14.522	261	22.56	261	53.664	254	47.89	109	39.434	286	22.25	35	13.350	247	62.30	214
30.6	14.748	226	25.43	287	53.896	232	46.77	112	39.695	261	21.97	28	13.571	221	64.63	233
June 9.6	14.936	188	28.49	306	54.099	203	45.65	112	39.927	232	21.80	17	13.763	192	67.10	247
19.5	15.079	143	31.64	315	54.271	172	44.57	108	40.122	195	21.72	8	13.919	156	69.62	252
29.5	15.174	95	34.80	316	54.406	135	43.55	102	40.277	155	21.74	— 2	14.036	117	72.14	252
July 9.5	15.218	44	37.87	307	54.501	95	42.62	93	40.388	111	21.86	12	14.110	74	74.58	244
19.5	15.212	— 6	40.82	295	54.553	52	41.81	81	40.453	65	22.08	22	14.141	31	76.90	232
29.4	15.157	55	43.55	273	54.562	9	41.12	69	40.469	16	22.37	29	14.128	— 13	79.03	213
Aug. 8.4	15.052	105	46.01	246	54.529	— 33	40.55	57	40.437	— 32	22.70	33	14.071	57	80.94	191
18.4	14.903	149	48.15	214	54.455	74	40.10	45	40.360	77	23.05	35	13.976	95	82.58	164
28.3	14.716	187	49.92	177	54.345	110	39.76	34	40.243	117	23.39	34	13.843	133	83.95	137
Sept. 7.3	14.496	220	51.31	139	54.206	139	39.53	23	40.092	151	23.70	31	13.680	163	85.00	105
17.3	14.252	244	52.27	96	54.043	163	39.40	13	39.915	177	23.94	24	13.496	184	85.72	72
27.3	13.993	259	52.77	50	53.868	175	39.35	5	39.723	192	24.10	16	13.297	199	86.10	38
Oct. 7.2	13.731	262	52.81	4	53.688	180	39.39	— 4	39.526	197	24.16	6	13.093	204	86.15	5
17.2	13.476	255	52.39	— 42	53.515	173	39.51	12	39.335	191	24.12	— 4	12.895	198	85.83	— 32
27.2	13.237	239	51.49	90	53.359	156	39.72	21	39.162	173	23.98	14	12.712	183	85.17	66
Nov. 6.2	13.026	211	50.15	134	53.228	131	40.01	29	39.016	146	23.73	25	12.553	159	84.16	101
16.1	12.851	175	48.37	178	53.130	98	40.39	38	38.908	108	23.41	32	12.426	127	82.82	134
26.1	12.720	131	46.19	218	53.072	58	40.85	46	38.843	65	23.04	37	12.335	91	81.17	165
Dec. 6.1	12.636	84	43.67	252	53.056	16	41.41	56	38.825	18	22.64	40	12.287	48	79.26	191
16.0	12.605	31	40.88	279	53.085	— 29	42.05	64	38.857	— 32	22.23	41	12.284	3	77.11	215
26.0	12.628	— 23	37.89	299	53.158	73	42.77	72	38.938	81	21.83	40	12.326	— 42	74.82	229
36.0	12.704	76	34.81	308	53.273	115	43.53	76	39.067	129	21.45	38	12.412	86	72.44	238
Mean Place	11.758		27.12		50.390		52.09		35.761		30.76		10.482		64.16	
Sec δ, Tan δ	1.282		+0.802		1.013		−0.161		1.123		−0.511		1.067		+0.373	
$D_\psi \alpha$, $D_\omega \alpha$	+0.04		−0.01		+0.07		0.00		+0.07		+0.01		+0.05		0.00	
$D_\psi \delta$, $D_\omega \delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

Washington Mean Time.	6 Aquilæ. Mag. 4.5				λ Pavonis. Mag. 4.4				β Lyræ. Var. 3.4–4.1				50 Draconis. Mag. 5.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 18 42		° ′ − 4 49		h m 18 44		° ′ −62 16		h m 18 47		° ′ +33 15		h m 18 48		° ′ +75 20	
	s		″		s		″		s		″		s		″	
Jan. 1.0	52.304	133	65.10	100	41.79	24	51.96	242	4.500	100	68.18	287	53.91	0	25.04	345
11.0	52.437	169	66.10	97	42.03	32	49.54	233	4.600	144	65.31	282	53.91	16	21.59	342
21.0	52.606	200	67.07	90	42.35	39	47.21	216	4.744	185	62.49	263	54.07	34	18.17	325
30.9	52.806	225	67.97	79	42.74	44	45.05	198	4.929	222	59.86	238	54.41	47	14.92	296
Feb. 9.9	53.031	246	68.76	61	43.18	50	43.07	173	5.151	253	57.48	200	54.88	61	11.96	256
19.9	53.277	264	69.37	41	43.68	54	41.34	147	5.404	277	55.48	155	55.49	72	9.40	206
Mar. 1.8	53.541	276	69.78	16	44.22	56	39.87	118	5.681	299	53.93	104	56.21	82	7.34	149
11.8	53.817	285	69.94	9	44.78	60	38.69	89	5.980	311	52.89	48	57.03	86	5.85	85
21.8	54.102	291	69.85	34	45.38	60	37.80	56	6.291	319	52.41	9	57.89	89	5.00	19
31.8	54.393	291	69.51	60	45.98	60	37.24	25	6.610	320	52.50	65	58.78	89	4.81	48
Apr. 10.7	54.684	289	68.91	82	46.58	57	36.99	7	6.930	316	53.15	118	59.67	86	5.29	110
20.7	54.973	282	68.09	101	47.15	58	37.06	39	7.246	303	54.33	167	60.53	80	6.39	169
30.7	55.255	270	67.08	118	47.73	54	37.45	72	7.549	287	56.00	209	61.33	71	8.08	222
May 10.7	55.525	252	65.90	127	48.27	50	38.17	100	7.836	262	58.09	243	62.04	62	10.30	265
20.6	55.777	232	64.63	134	48.77	46	39.17	129	8.098	233	60.52	271	62.66	50	12.95	302
30.6	56.009	203	63.29	136	49.23	40	40.46	154	8.331	198	63.23	289	63.16	36	15.97	328
June 9.6	56.212	172	61.93	133	49.63	33	42.00	175	8.529	157	66.12	300	63.52	22	19.25	344
19.5	56.384	136	60.60	127	49.96	25	43.75	190	8.686	114	69.12	301	63.74	8	22.69	353
29.5	56.520	96	59.33	117	50.21	17	45.65	202	8.800	66	72.13	295	63.82	8	26.22	349
July 9.5	56.616	54	58.16	107	50.38	7	47.67	207	8.866	19	75.08	284	63.74	23	29.71	340
19.5	56.670	11	57.09	93	50.45	1	49.74	205	8.885	30	77.92	263	63.51	36	33.11	323
29.4	56.681	32	56.16	80	50.44	9	51.79	197	8.855	77	80.55	239	63.15	49	36.34	296
Aug. 8.4	56.649	71	55.36	64	50.35	18	53.76	179	8.778	120	82.94	209	62.66	61	39.30	265
18.4	56.578	108	54.72	50	50.17	25	55.55	157	8.658	160	85.03	176	62.05	73	41.95	228
28.4	56.470	137	54.22	36	49.92	32	57.12	126	8.498	192	86.79	140	61.32	81	44.23	188
Sept. 7.3	56.333	161	53.86	22	49.60	37	58.38	91	8.306	217	88.19	99	60.51	88	46.11	141
17.3	56.172	174	53.64	9	49.23	39	59.29	51	8.089	232	89.18	58	59.63	92	47.52	90
27.3	55.998	178	53.55	3	48.84	41	59.80	8	7.857	239	89.76	14	58.71	94	48.42	40
Oct. 7.2	55.820	174	53.58	16	48.43	40	59.88	37	7.618	234	89.90	29	57.77	94	48.82	13
17.2	55.646	157	53.74	29	48.03	37	59.51	81	7.384	219	89.61	73	56.83	92	48.69	68
27.2	55.489	134	54.03	41	47.66	31	58.70	122	7.165	197	88.88	116	55.91	87	48.01	121
Nov. 6.2	55.355	101	54.44	53	47.35	26	57.48	160	6.968	163	87.72	158	55.04	78	46.80	172
16.1	55.254	64	54.97	67	47.09	19	55.88	190	6.805	124	86.14	196	54.26	68	45.08	221
26.1	55.190	22	55.64	77	46.90	9	53.98	216	6.681	80	84.18	229	53.58	57	42.87	264
Dec. 6.1	55.168	22	56.41	87	46.81	1	51.82	232	6.601	31	81.89	257	53.01	42	40.23	301
16.1	55.190	65	57.28	95	46.80	8	49.50	241	6.570	18	79.32	276	52.59	27	37.22	326
26.0	55.255	106	58.23	100	46.88	19	47.09	243	6.588	67	76.56	287	52.32	10	33.96	343
36.0	55.361		59.23		47.07		44.66		6.655		73.69		52.22		30.53	
Mean Place	52.597		68.17		42.917		55.33		5.348		64.27		59.741		19.72	
Sec δ, Tan δ	1.004		−0.085		2.150		−1.903		1.196		+0.656		3.952		+3.823	
$D_\psi a$, $D_\omega a$	+0.06		0.00		+0.11		+0.02		+0.04		−0.01		−0.04		−0.05	
$D_\psi \delta$, $D_\omega \delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	o Draconis. Mag. 4.8				σ Sagittarii. Mag. 2.1				θ Serpentis *pr.* Mag. 4.5				R Lyræ. Var. 4.0–4.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	18 49		+59 17		18 50		−26 23		18 52		+ 4 5		18 52		+43 50	
	s		″		s		″		s		″		s		″	
Jan. 1.0	58.225		25.41		14.270		52.15		11.195		53.29		51.023		24.21	
11.0	58.286	61	21.96	345	14.416	146	51.78	37	11.313	118	51.81	148	51.105	82	21.03	318
21.0	58.427	141	18.56	340	14.601	185	51.42	36	11.466	153	50.35	146	51.240	135	17.90	313
30.9	58.643	216	15.32	324	14.822	221	51.07	35	11.650	184	48.99	136	51.425	185	14.94	296
Feb. 9.9	58.928	285	12.40	292	15.072	250	50.72	35	11.862	212	47.80	119	51.655	230	12.27	267
19.9	59.273	345	9.89	251	15.345	273	50.35	37	12.097	235	46.83	97	51.925	270	9.98	229
Mar. 1.8	59.668	395	7.88	201	15.637	292	49.95	40	12.351	254	46.13	70	52.228	303	8.18	180
11.8	60.102	434	6.48	140	15.945	308	49.51	44	12.619	268	45.76	37	52.555	327	6.92	126
21.8	60.562	460	5.69	79	16.263	318	49.03	48	12.898	279	45.71	5	52.901	346	6.26	66
31.8	61.036	474	5.57	12	16.588	325	48.52	51	13.184	286	46.01	30	53.257	356	6.23	3
Apr. 10.7	61.511	475	6.12	55	16.915	327	47.98	54	13.472	288	46.65	64	53.616	359	6.80	57
20.7	61.975	464	7.29	117	17.240	325	47.43	55	13.759	287	47.59	94	53.968	352	7.97	117
30.7	62.414	439	9.05	176	17.560	320	46.89	54	14.040	281	48.82	123	54.308	340	9.68	171
May 10.7	62.817	403	11.32	227	17.867	307	46.39	50	14.311	271	50.27	145	54.626	318	11.86	218
20.6	63.175	358	14.04	272	18.158	291	45.95	44	14.564	253	51.90	163	54.915	289	14.45	259
30.6	63.479	304	17.10	306	18.424	266	45.58	37	14.796	232	53.64	174	55.168	253	17.35	290
June 9.6	63.719	240	20.41	331	18.663	239	45.33	25	15.001	205	55.45	181	55.380	212	20.48	313
19.5	63.891	172	23.89	348	18.866	203	45.17	16	15.174	173	57.27	182	55.545	165	23.74	326
29.5	63.990	99	27.42	353	19.030	164	45.12	5	15.311	137	59.04	177	55.659	114	27.05	331
July 9.5	64.016	26	30.92	350	19.150	120	45.18	6	15.409	98	60.74	170	55.720	61	30.33	328
19.5	63.965	51	34.32	340	19.223	73	45.34	16	15.465	56	62.30	156	55.725	5	33.49	316
29.4	63.841	124	37.53	321	19.248	25	45.60	26	15.478	13	63.73	143	55.675	50	36.45	296
Aug. 8.4	63.645	196	40.47	294	19.224	24	45.90	30	15.448	30	64.97	124	55.572	103	39.16	271
18.4	63.385	260	43.09	262	19.155	69	46.25	35	15.378	70	66.03	106	55.420	152	41.57	241
28.4	63.070	315	45.33	224	19.045	110	46.60	35	15.272	106	66.89	86	55.224	196	43.62	205
Sept. 7.3	62.705	365	47.14	181	18.900	145	46.92	32	15.136	136	67.54	65	54.992	232	45.27	165
17.3	62.303	402	48.49	135	18.727	173	47.20	28	14.975	161	67.98	44	54.730	262	46.48	121
27.3	61.878	425	49.34	85	18.539	188	47.40	20	14.801	174	68.20	22	54.450	280	47.24	76
Oct. 7.2	61.442	436	49.67	33	18.343	196	47.51	11	14.620	181	68.22	2	54.162	288	47.51	27
17.2	61.008	434	49.47	20	18.152	191	47.53	2	14.443	177	68.02	20	53.877	285	47.30	21
27.2	60.591	417	48.72	75	17.976	176	47.44	9	14.280	163	67.62	40	53.605	272	46.59	71
Nov. 6.2	60.206	385	47.45	127	17.827	149	47.27	17	14.138	142	67.01	61	53.358	247	45.39	120
16.1	59.864	342	45.66	179	17.713	114	47.00	27	14.027	111	66.19	82	53.146	212	43.72	167
26.1	59.578	286	43.40	226	17.641	72	46.69	31	13.952	75	65.19	100	52.975	171	41.62	210
Dec. 6.1	59.356	222	40.71	269	17.614	27	46.34	35	13.917	35	64.01	118	52.854	121	39.13	249
16.1	59.208	148	37.68	303	17.636	22	45.97	37	13.924	7	62.68	133	52.785	69	36.34	279
26.0	59.136	72	34.40	328	17.706	70	45.60	37	13.972	48	61.25	143	52.773	12	33.30	304
36.0	59.147	11	30.96	344	17.823	117	45.24	36	14.062	90	59.75	150	52.817	44	30.14	316
Mean Place	60.506		20.47		14.554		55.10		11.546		49.86		52.240		19.51	
Sec δ, Tan δ	1.958		+1.684		1.116		−0.496		1.003		+0.072		1.386		+0.960	
$D_\psi \alpha$, $D_\omega \alpha$	+0.02		−0.02		+0.07		+0.01		+0.06		0.00		+0.04		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

Washington Mean Time.	γ Lyræ. Mag. 3.3				ε Aquilæ. Mag. 4.2				ζ Sagittarii. Mag. 2.7				ζ Aquilæ. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	18 55		+32 34		18 55		+14 57		18 57		−29 59		19 1		+13 44	
	s		″		s		″		s		″		s		″	
Jan. 1.0	53.968		43.93		56.279		30.16		27.214		47.57		40.765		35.71	
11.0	54.058	90	41.11	282	56.385	106	28.10	206	27.356	142	46.95	62	40.865	100	33.72	199
21.0	54.193	135	38.33	278	56.527	142	26.09	201	27.540	184	46.34	61	41.002	137	31.77	195
30.9	54.368	175	35.71	262	56.703	176	24.19	190	27.760	220	45.74	60	41.174	172	29.94	183
Feb. 9.9	54.581	213	33.33	238	56.910	207	22.50	169	28.011	251	45.15	59	41.376	202	28.30	164
19.9	54.824	243	31.32	201	57.141	231	21.09	141	28.287	276	44.56	59	41.602	226	26.93	137
Mar. 1.8	55.094	270	29.74	158	57.393	252	20.02	107	28.584	297	43.97	59	41.850	248	25.90	103
11.8	55.387	293	28.66	108	57.661	268	19.35	67	28.897	313	43.38	59	42.115	265	25.25	65
21.8	55.694	307	28.13	53	57.941	280	19.11	24	29.223	326	42.78	60	42.393	278	25.02	23
31.8	56.010	316	28.17	— 4	58.229	288	19.30	— 19	29.556	333	42.19	59	42.680	287	25.21	— 19
Apr. 10.7	56.329	319	28.76	59	58.521	292	19.93	63	29.893	337	41.60	59	42.971	291	25.83	62
20.7	56.645	316	29.88	112	58.810	289	20.96	103	30.229	336	41.04	56	43.262	291	26.85	102
30.7	56.951	306	31.49	161	59.094	284	22.35	139	30.560	331	40.53	51	43.547	285	28.21	136
May 10.7	57.242	291	33.52	203	59.366	272	24.07	172	30.881	321	40.09	44	43.822	275	29.90	169
20.6	57.511	269	35.91	239	59.620	254	26.03	196	31.184	303	39.73	36	44.080	258	31.82	192
30.6	57.751	240	38.59	268	59.852	232	28.19	216	31.465	281	39.49	24	44.317	237	33.94	212
June 9.6	57.957	206	41.45	286	60.056	204	30.46	227	31.716	251	39.36	13	44.525	208	36.17	223
19.5	58.123	166	44.42	297	60.226	170	32.78	232	31.932	216	39.36	0	44.701	176	38.44	227
29.5	58.247	124	47.42	300	60.360	134	35.10	232	32.108	176	39.48	12	44.841	140	40.71	227
July 9.5	58.324	77	50.38	296	60.453	93	37.34	224	32.239	131	39.74	26	44.940	99	42.91	220
19.5	58.353	29	53.22	284	60.503	50	39.45	211	32.322	83	40.10	36	44.996	56	44.99	208
29.4	58.334	— 19	55.88	266	60.509	6	41.41	196	32.354	32	40.54	44	45.009	13	46.91	192
Aug. 8.4	58.268	66	58.31	243	60.473	— 36	43.17	176	32.337	— 17	41.04	50	44.978	— 31	48.63	172
18.4	58.157	111	60.44	213	60.395	78	44.68	151	32.272	65	41.56	52	44.906	72	50.13	150
28.4	58.006	151	62.26	182	60.280	115	45.94	126	32.163	109	42.08	52	44.796	110	51.37	124
Sept. 7.3	57.822	184	63.71	145	60.135	145	46.93	99	32.018	145	42.55	47	44.656	140	52.35	98
17.3	57.611	211	64.78	107	59.964	171	47.62	69	31.842	176	42.95	40	44.490	166	53.05	70
27.3	57.384	227	65.42	64	59.779	185	48.03	41	31.648	194	43.25	30	44.308	182	53.46	41
Oct. 7.2	57.149	235	65.65	23	59.587	192	48.12	9	31.446	202	43.42	17	44.119	189	53.57	11
17.2	56.917	232	65.44	— 21	59.397	190	47.91	— 21	31.247	199	43.45	3	43.931	188	53.39	— 18
27.2	56.698	219	64.80	64	59.220	177	47.40	51	31.062	185	43.34	— 11	43.755	176	52.92	47
Nov. 6.2	56.501	197	63.72	108	59.066	154	46.57	83	30.904	158	43.09	25	43.601	154	52.14	78
16.1	56.335	166	62.25	147	58.940	126	45.46	111	30.779	125	42.73	36	43.474	127	51.09	105
26.1	56.207	128	60.37	188	58.849	91	44.08	138	30.697	82	42.27	46	43.381	93	49.77	132
Dec. 6.1	56.121	86	58.16	221	58.798	51	42.45	163	30.662	35	41.74	53	43.328	53	48.22	155
16.1	56.083	38	55.67	249	58.791	7	40.63	182	30.676	— 14	41.16	58	43.317	11	46.47	175
26.0	56.093	— 10	52.97	270	58.826	— 35	38.66	197	30.740	64	40.56	60	43.348	— 31	44.57	190
36.0	56.151	58	50.15	282	58.903	77	36.60	206	30.851	111	39.95	61	43.421	73	42.59	198
Mean Place	54.785		39.40		56.746		26.25		27.519		50.36		41.211		31.58	
Sec δ, Tan δ	1.187		+0.639		1.035		+0.267		1.155		−0.577		1.029		+0.245	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.04		−0.01		+0.05		0.00		+0.08		+0.01		+0.05		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Aquilæ. Mag. 3.6				α Coronæ Australis. Mag. 4.1				ι Lyræ. Mag. 5.1				π Sagittarii. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 19 1		° ′ − 5 0		h m 19 3		° ′ −38 1		h m 19 4		° ′ +35 58		h m 19 4		° ′ −21 9	
	s		″		s		″		s		″		s		″	
Jan. 1.0	56.731		14.27		57.336		53.04		23.804		26.00		56.582		9.61	
11.0	56.846	115	15.20	93	57.481	145	51.90	114	23.880	76	23.08	292	56.707	125	9.52	9
21.0	56.997	151	16.10	90	57.670	189	50.78	112	24.003	123	20.19	289	56.871	164	9.43	9
30.9	57.179	182	16.94	84	57.901	231	49.69	109	24.170	167	17.44	275	57.068	197	9.31	12
Feb. 9.9	57.389	210	17.65	71	58.168	267	48.63	106	24.377	207	14.95	249	57.294	226	9.15	16
19.9	57.621	232	18.20	55	58.463	295	47.64	99	24.618	241	12.81	214	57.546	252	8.91	24
Mar. 1.9	57.874	253	18.55	35	58.782	319	46.70	94	24.889	271	11.11	170	57.816	270	8.61	30
11.8	58.141	267	18.66	11	59.121	339	45.82	88	25.183	294	9.91	120	58.104	288	8.22	39
21.8	58.421	280	18.51	— 15	59.475	354	45.02	80	25.496	313	9.26	65	58.405	301	7.73	49
31.8	58.708	287	18.11	40	59.838	363	44.31	71	25.819	323	9.19	7	58.714	309	7.15	58
Apr. 10.7	59.001	293	17.46	65	60.206	368	43.68	63	26.148	329	9.70	— 51	59.028	314	6.49	66
20.7	59.293	292	16.59	87	60.575	369	43.16	52	26.475	327	10.78	108	59.343	315	5.75	74
30.7	59.581	288	15.51	108	60.938	363	42.77	39	26.793	318	12.36	158	59.654	311	4.99	76
May 10.7	59.861	280	14.30	121	61.290	352	42.52	25	27.095	302	14.39	203	59.956	302	4.22	77
20.6	60.125	264	12.98	132	61.625	335	42.43	9	27.376	281	16.80	241	60.244	288	3.47	75
30.6	60.370	245	11.59	139	61.935	310	42.50	— 7	27.627	251	19.52	272	60.511	267	2.78	69
June 9.6	60.588	218	10.18	141	62.214	279	42.75	25	27.843	216	22.45	293	60.752	241	2.16	62
19.6	60.777	189	8.80	138	62.454	240	43.16	41	28.020	177	25.53	308	60.961	209	1.64	52
29.5	60.929	152	7.49	131	62.650	196	43.72	56	28.152	132	28.65	312	61.131	170	1.22	42
July 9.5	61.042	113	6.27	122	62.797	147	44.43	71	28.236	84	31.72	307	61.261	130	0.93	29
19.5	61.113	71	5.17	110	62.891	94	45.24	81	28.270	34	34.70	298	61.345	84	0.77	16
29.4	61.140	27	4.21	96	62.931	40	46.14	90	28.253	— 17	37.52	282	61.382	37	0.71	6
Aug. 8.4	61.124	— 16	3.39	82	62.915	— 16	47.06	92	28.187	66	40.09	257	61.373	— 9	0.74	— 3
18.4	61.066	58	2.73	66	62.847	68	47.98	92	28.075	112	42.39	230	61.318	55	0.85	11
28.4	60.972	94	2.22	51	62.730	117	48.85	87	27.921	154	44.35	196	61.224	94	1.02	17
Sept. 7.3	60.844	128	1.86	36	62.572	158	49.62	77	27.731	190	45.95	160	61.093	131	1.22	20
17.3	60.692	152	1.64	22	62.382	190	50.24	62	27.513	218	47.15	120	60.933	160	1.43	21
27.3	60.522	170	1.54	10	62.168	214	50.70	46	27.276	237	47.93	78	60.756	177	1.62	19
Oct. 7.3	60.345	177	1.57	— 3	61.944	224	50.94	24	27.030	246	48.26	33	60.570	186	1.78	16
17.2	60.170	175	1.73	16	61.722	222	50.97	3	26.785	245	48.15	— 11	60.385	185	1.89	11
27.2	60.009	161	2.01	28	61.515	207	50.77	— 20	26.550	235	47.58	57	60.214	171	1.96	7
Nov. 6.2	59.867	142	2.41	40	61.333	182	50.36	41	26.338	212	46.55	103	60.065	149	1.97	1
16.1	59.756	111	2.92	51	61.188	145	49.76	60	26.154	184	45.10	145	59.947	118	1.95	— 2
26.1	59.679	77	3.55	63	61.088	100	48.97	79	26.008	146	43.24	186	59.867	80	1.91	4
Dec. 6.1	59.642	37	4.29	74	61.038	50	48.05	92	25.906	102	41.01	223	59.829	38	1.84	7
16.1	59.647	— 5	5.12	83	61.043	— 5	47.03	102	25.851	55	38.48	253	59.836	— 7	1.77	7
26.0	59.693	46	6.02	90	61.101	58	45.95	108	25.845	6	35.72	276	59.889	53	1.71	6
36.0	59.781	88	6.96	94	61.211	110	44.83	112	25.888	— 43	32.82	290	59.985	96	1.64	7
Mean Place	57.018		17.67		57.723		55.54		24.702		20.67		56.850		12.49	
Sec δ, Tan δ	1.004		−0.088		1.270		−0.782		1.236		+0.726		1.072		−0.387	
Dψa, Dωa	+0.06		0.00		+0.08		+0.01		+0.04		−0.01		+0.07		+0.01	
Dψδ, Dωδ	*+0.1*		*−1.0*		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ Sagittarii. Mag. 4.9				δ Draconis. Mag. 3.2				d Sagittarii. Mag. 5.0				θ Lyræ. Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 19 10		° ′ −25 23		h m 19 12		° ′ +67 30		h m 19 12		° ′ −19 5		h m 19 13		° ′ +37 59	
	s		″		s		″		s		″		s		″	
Jan. 1.0	34.209		48.21		29.12		76.08		53.521		50.46		32.403		25.96	
11.0	34.332	123	47.84	37	29.10	2	72.66	342	53.636	115	50.48	2	32.466	63	23.01	295
21.0	34.495	163	47.45	39	29.19	— 9	69.21	345	53.789	153	50.49	1	32.578	112	20.06	295
30.9	34.693	198	47.05	40	29.38	19	65.87	334	53.975	186	50.45	— 4	32.735	157	17.24	282
Feb. 9.9	34.921	228	46.63	42	29.68	30	62.79	308	54.192	217	50.36	9	32.934	199	14.66	258
19.9	35.176	255	46.17	46	30.08	40	60.05	274	54.432	240	50.19	17	33.169	235	12.43	223
Mar. 1.9	35.452	276	45.66	51	30.54	46	57.78	227	54.695	263	49.92	27	33.438	269	10.62	181
11.8	35.745	293	45.10	56	31.07	53	56.07	171	54.974	279	49.54	38	33.733	295	9.32	130
21.8	36.053	308	44.49	61	31.64	57	54.96	111	55.266	292	49.05	49	34.047	314	8.58	74
31.8	36.370	317	43.82	67	32.25	61	54.53	43	55.570	304	48.44	61	34.376	329	8.42	16
Apr. 10.7	36.694	324	43.11	71	32.86	61	54.74	— 21	55.879	309	47.72	72	34.711	335	8.86	— 44
20.7	37.019	325	42.39	72	33.45	59	55.62	88	56.190	311	46.92	80	35.047	336	9.86	100
30.7	37.341	322	41.67	72	34.05	60	57.10	148	56.499	309	46.07	85	35.375	328	11.38	152
May 10.7	37.655	314	41.00	67	34.59	54	59.13	203	56.798	299	45.20	87	35.688	313	13.38	200
20.6	37.954	299	40.37	63	35.08	49	61.64	251	57.086	288	44.32	88	35.980	292	15.78	240
30.6	38.233	279	39.82	55	35.48	40	64.56	292	57.356	270	43.48	84	36.243	263	18.50	272
June 9.6	38.485	252	39.38	44	35.81	33	67.78	322	57.599	243	42.71	77	36.471	228	21.45	295
19.6	38.705	220	39.06	32	36.06	25	71.21	343	57.811	212	42.05	66	36.659	188	24.57	312
29.5	38.887	182	38.87	19	36.21	15	74.78	357	57.987	176	41.48	57	36.799	140	27.75	318
July 9.5	39.027	140	38.81	6	36.26	5	78.38	360	58.122	135	41.05	43	36.890	91	30.92	317
19.5	39.118	91	38.87	— 6	36.20	— 6	81.90	352	58.213	91	40.74	31	36.932	42	34.00	308
29.4	39.162	44	39.05	18	36.05	15	85.31	341	58.257	44	40.56	18	36.921	— 11	36.92	292
Aug. 8.4	39.159	— 3	39.32	27	35.81	24	88.50	319	58.255	— 2	40.48	8	36.860	61	39.63	271
18.4	39.109	50	39.65	33	35.48	33	91.39	289	58.209	46	40.50	— 2	36.751	109	42.04	241
28.4	39.016	93	40.02	37	35.07	41	93.95	256	58.121	88	40.59	9	36.597	154	44.13	209
Sept. 7.3	38.884	132	40.39	37	34.59	48	96.11	216	57.996	125	40.73	14	36.407	190	45.86	173
17.3	38.723	161	40.73	34	34.06	53	97.83	172	57.843	153	40.91	18	36.186	221	47.19	133
27.3	38.542	181	41.02	29	33.49	57	99.06	123	57.670	173	41.10	19	35.945	241	48.09	90
Oct. 7.3	38.350	192	41.23	21	32.90	59	99.78	72	57.487	183	41.27	17	35.693	252	48.55	46
17.2	38.159	191	41.36	13	32.30	60	99.97	19	57.305	182	41.42	15	35.439	254	48.53	— 2
27.2	37.979	180	41.39	3	31.71	59	99.60	— 37	57.134	171	41.54	12	35.195	244	48.06	47
Nov. 6.2	37.823	156	41.33	— 6	31.15	56	98.68	92	56.983	151	41.63	9	34.970	225	47.12	94
16.1	37.698	125	41.18	15	30.64	51	97.21	147	56.862	121	41.70	7	34.774	196	45.73	139
26.1	37.610	88	40.95	23	30.19	45	95.24	197	56.778	84	41.75	5	34.615	159	43.91	182
Dec. 6.1	37.566	44	40.68	27	29.81	38	92.80	244	56.733	45	41.79	4	34.498	117	41.71	220
16.1	37.568	— 2	40.37	31	29.52	29	89.97	283	56.733	0	41.83	4	34.427	71	39.18	253
26.0	37.617	49	40.04	33	29.34	18	86.81	316	56.776	43	41.87	4	34.407	20	36.42	276
36.0	37.710	93	39.70	34	29.25	9	83.44	337	56.863	87	41.91	4	34.436	— 29	33.49	293
Mean Place	34.489		50.89		32.458		68.50		53.780		53.38		33.349		19.84	
Sec δ, Tan δ	1.107		−0.475		2.616		+2.417		1.058		−0.346		1.269		+0.781	
Dψα, Dωα	+0.07		+0.01		0.00		−0.05		+0.07		+0.01		+0.04		−0.02	
Dψδ, Dωδ	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ω Aquilæ. Mag. 5.1				κ Cygni. Mag. 4.0				τ Draconis. Mag. 4.6				δ Aquilæ. Mag. 3.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 14		+11 26		19 15		+53 12		19 17		+73 12		19 21		+ 2 57	
	s		″		s		″		s		″		s		″	
Jan. 1.0	0.462		58.77		12.227		73.81		2.50		28.13		24.551		12.54	
		90		183		33		330		8		339		90		133
11.0	0.552		56.94		12.260		70.51		2.42	—	24.74		24.641		11.21	
		128		180		101		331		6		343		127		131
21.0	0.680		55.14		12.361		67.20		2.48		21.31		24.768		9.90	
		161		169		163		320		22		335		159		122
30.9	0.841		53.45		12.524		64.00		2.70		17.96		24.927		8.68	
		190		152		223		295		35		311		187		109
Feb. 9.9	1.031		51.93		12.747		61.05		3.05		14.85		25.114		7.59	
		217		127		276		259		47		279		214		88
19.9	1.248		50.66		13.023		58.46		3.52		12.06		25.328		6.71	
		240		96		323		213		58		232		236		61
Mar. 1.9	1.488		49.70		13.346		56.33		4.10		9.74		25.564		6.10	
		258		60		361		159		67		180		255		32
11.8	1.746		49.10		13.707		54.74		4.77		7.94		25.819		5.78	
		272		20		391		98		73		119		268		1
21.8	2.018		48.90	—	14.098		53.76		5.50		6.75		26.087		5.77	—
		283		20		408		34		79		55		280		33
31.8	2.301		49.10		14.506		53.42	—	6.29		6.20	—	26.367		6.10	
		289		61		418		29		79		12		288		66
Apr. 10.8	2.590		49.71		14.924		53.71		7.08		6.32		26.655		6.76	
		292		98		415		94		78		77		292		96
20.7	2.882		50.69		15.339		54.65		7.86		7.09		26.947		7.72	
		288		133		403		152		74		139		290		123
30.7	3.170		52.02		15.742		56.17		8.60		8.48		27.237		8.95	
		280		163		382		205		69		193		283		145
May 10.7	3.450		53.65		16.124		58.22		9.29		10.41		27.520		10.40	
		264		185		348		252		62		243		271		164
20.6	3.714		55.50		16.472		60.74		9.91		12.84		27.791		12.04	
		246		205		308		288		52		284		251		175
30.6	3.960		57.55		16.780		63.62		10.43		15.68		28.042		13.79	
		218		215		259		319		42		317		229		182
June 9.6	4.178		59.70		17.039		66.81		10.85		18.85		28.271		15.61	
		189		220		204		337		29		339		199		183
19.6	4.367		61.90		17.243		70.18		11.14		22.24		28.470		17.44	
		152		219		143		349		17		354		163		179
29.5	4.519		64.09		17.386		73.67		11.31		25.78		28.633		19.23	
		112		212		80		350		4		358		126		172
July 9.5	4.631		66.21		17.466		77.17		11.35	—	29.36		28.759		20.95	
		70		201		15		343		9		353		83		158
19.5	4.701		68.22		17.481	—	80.60		11.26		32.89		28.842		22.53	
		26		186		53		329		22		342		40		145
29.5	4.727	—	70.08		17.428		83.89		11.04		36.31		28.882	—	23.98	
		18		166		115		306		34		323		4		128
Aug. 8.4	4.709		71.74		17.313		86.95		10.70		39.54		28.878		25.26	
		60		145		174		278		45		295		44		107
18.4	4.649		73.19		17.139		89.73		10.25		42.49		28.834		26.33	
		97		121		229		244		56		263		85		89
28.4	4.552		74.40		16.910		92.17		9.69		45.12		28.749		27.22	
		131		96		276		204		65		224		119		68
Sept. 7.3	4.421		75.36		16.634		94.21		9.04		47.36		28.630		27.90	
		157		70		313		161		72		182		145		49
17.3	4.264		76.06		16.321		95.82		8.32		49.18		28.485		28.39	
		175		43		339		113		77		134		166		26
27.3	4.089		76.49		15.982		96.95		7.55		50.52		28.319		28.65	
		185		15		355		64		80		83		175		8
Oct. 7.3	3.904		76.64	—	15.627		97.59		6.75		51.35		28.144		28.73	—
		184		12		357		11		81		30		176		13
17.2	3.720		76.52		15.270		97.70	—	5.94		51.65	—	27.968		28.60	
		174		40		348		41		81		25		167		33
27.2	3.546		76.12		14.922		97.29		5.13		51.40		27.801		28.27	
		156		68		327		95		77		80		150		51
Nov. 6.2	3.390		75.44		14.595		96.34		4.36		50.60		27.651		27.76	
		129		93		293		146		71		134		123		71
16.2	3.261		74.51		14.302		94.88		3.65		49.26		27.528		27.05	
		97		119		251		195		63		187		93		87
26.1	3.164		73.32		14.051		92.93		3.02		47.39		27.435		26.18	
		59		140		199		239		55		234		56		104
Dec. 6.1	3.105		71.92		13.852		90.54		2.47		45.05		27.379		25.14	
		19		160		139		276		43		277		16		119
16.1	3.086	—	70.32		13.713		87.78		2.04		42.28		27.363	—	23.95	
		22		174		77		307		30		309		24		128
26.0	3.108		68.58		13.636		84.71		1.74		39.19		27.387		22.67	
		62		182		10		326		17		332		63		134
36.0	3.170		66.76		13.626		81.45		1.57		35.87		27.450		21.33	
Mean Place	0.868		54.23		13.906		66.67		7.262		19.82		24.869		8.31	
Sec δ, Tan δ	1.020		+0.203		1.670		+1.338		3.462		+3.314		1.001		+0.052	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.06		0.00		+0.03		−0.03		−0.02		−0.07		+0.06		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		−0.9		+0.1		−0.9		+0.1		−0.9		+0.1		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Cygni. Mag. 3.2				ι Cygni. Mag. 3.9				μ Aquilæ. Mag. 4.6				h Sagittarii. Mag. 4.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 27		+27 47		19 27		+51 33		19 30		+ 7 12		19 31		−25 3	
	s		″		s		″		s		″		s		″	
Jan. 1.0	26.624	61	25.70	254	38.342	18	32.31	323	7.637	78	26.99	156	46.495	100	46.23	40
11.0	26.685	102	23.16	255	38.360	82	29.08	327	7.715	115	25.43	153	46.595	138	45.83	44
21.0	26.787	141	20.61	244	38.442	144	25.81	318	7.830	147	23.90	145	46.733	176	45.39	47
31.0	26.928	179	18.17	225	38.586	201	22.63	295	7.977	179	22.45	130	46.909	207	44.92	52
Feb. 9.9	27.107	212	15.92	195	38.787	254	19.68	263	8.156	205	21.15	106	47.116	234	44.40	57
19.9	27.319	239	13.97	156	39.041	300	17.05	219	8.361	228	20.09	79	47.350	260	43.83	63
Mar. 1.9	27.558	264	12.41	112	39.341	340	14.86	167	8.589	249	19.30	48	47.610	279	43.20	72
11.8	27.822	284	11.29	63	39.681	370	13.19	109	8.838	265	18.82	12	47.889	295	42.48	76
21.8	28.106	298	10.66	10	40.051	393	12.10	44	9.103	278	18.70	25	48.184	311	41.72	82
31.8	28.404	308	10.56	42	40.444	403	11.66	18	9.381	286	18.95	61	48.495	319	40.90	87
Apr. 10.8	28.712	311	10.98	95	40.847	406	11.84	80	9.667	291	19.56	95	48.814	325	40.03	89
20.7	29.023	309	11.93	140	41.253	397	12.64	141	9.958	291	20.51	127	49.139	326	39.14	89
30.7	29.332	298	13.33	183	41.650	380	14.05	195	10.249	286	21.78	154	49.465	320	38.25	85
May 10.7	29.630	284	15.16	219	42.030	353	16.00	241	10.535	274	23.32	175	49.785	309	37.40	79
20.7	29.914	261	17.35	248	42.383	314	18.41	280	10.809	255	25.07	190	50.094	293	36.61	69
30.6	30.175	233	19.83	268	42.697	270	21.21	312	11.064	233	26.97	200	50.387	267	35.92	58
June 9.6	30.408	197	22.51	281	42.967	219	24.33	333	11.297	203	28.97	203	50.654	238	35.34	45
19.6	30.605	159	25.32	287	43.186	162	27.66	345	11.500	169	31.00	202	50.892	200	34.89	30
29.5	30.764	115	28.19	286	43.348	100	31.11	349	11.669	130	33.02	195	51.092	159	34.59	15
July 9.5	30.879	69	31.05	278	43.448	37	34.60	345	11.799	89	34.97	184	51.251	113	34.44	0
19.5	30.948	21	33.83	261	43.485	26	38.05	332	11.888	46	36.81	168	51.364	65	34.44	13
29.5	30.969	26	36.44	243	43.459	90	41.37	312	11.934	1	38.49	151	51.429	16	34.57	25
Aug. 8.4	30.943	71	38.87	217	43.369	148	44.49	285	11.935	42	40.00	131	51.445	32	34.82	34
18.4	30.872	113	41.04	190	43.221	202	47.34	253	11.893	81	41.31	108	51.413	77	35.16	39
28.4	30.759	150	42.94	156	43.019	251	49.87	215	11.812	116	42.39	86	51.336	117	35.55	43
Sept. 7.4	30.609	178	44.50	121	42.768	287	52.02	172	11.696	144	43.25	62	51.219	148	35.98	42
17.3	30.431	199	45.71	84	42.481	317	53.74	127	11.552	165	43.87	39	51.071	174	36.40	38
27.3	30.232	213	46.55	46	42.164	334	55.01	78	11.387	176	44.26	14	50.897	186	36.78	32
Oct. 7.3	30.019	215	47.01	5	41.830	339	55.79	27	11.211	178	44.40	9	50.711	190	37.10	23
17.2	29.804	207	47.06	36	41.491	334	56.06	26	11.033	171	44.31	33	50.521	182	37.33	14
27.2	29.597	192	46.70	75	41.157	314	55.80	78	10.862	155	43.98	54	50.339	164	37.47	5
Nov. 6.2	29.405	166	45.95	116	40.843	286	55.02	131	10.707	132	43.44	79	50.175	137	37.52	5
16.2	29.239	135	44.79	152	40.557	246	53.71	180	10.575	100	42.65	98	50.038	101	37.47	14
26.1	29.104	98	43.27	185	40.311	199	51.91	224	10.475	65	41.67	119	49.937	62	37.33	23
Dec. 6.1	29.006	56	41.42	215	40.112	144	49.67	265	10.410	27	40.48	135	49.875	18	37.10	27
16.1	28.950	13	39.27	236	39.968	85	47.02	296	10.383	13	39.13	147	49.857	27	36.83	32
26.1	28.937	31	36.91	253	39.883	23	44.06	317	10.396	52	37.66	155	49.884	69	36.51	36
36.0	28.968		34.38		39.860		40.89		10.448		36.11		49.953		36.15	
Mean Place	27.264		19.31		39.862		24.13		7.976		22.16		46.764		48.62	
Sec δ, Tan δ	1.130		+0.527		1.609		+1.260		1.008		+0.126		1.104		−0.468	
Dψα, Dωα	+0.05		−0.01		+0.03		−0.03		+0.06		0.00		+0.07		+0.01	
Dψδ, Dωδ	+0.1		−0.9		+0.1		−0.9		+0.2		−0.9		+0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Aquilæ. Mag. 5.0				θ Cygni. Mag. 4.6				54 Sagittarii. Mag. 5.4				β Sagittæ. Mag. 4.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 19 32		° ′ − 7 12		h m 19 34		° ′ +50 1		h m 19 36		° ′ −16 28		h m 19 37		° ′ +17 17	
	s		″		s		″		s		″		s		″	
Jan. 1.0	31.844	87	26.70	69	14.779	13	67.23	317	4.804	89	45.14	12	24.194	62	21.14	204
11.0	31.931	122	27.39	68	14.792	74	64.06	322	4.893	127	45.26	9	24.256	100	19.10	204
21.0	32.053	156	28.07	61	14.866	133	60.84	315	5.020	161	45.35	4	24.356	135	17.06	196
31.0	32.209	184	28.68	50	14.999	189	57.69	294	5.181	190	45.39	4	24.491	168	15.10	179
Feb. 9.9	32.393	211	29.18	35	15.188	241	54.75	262	5.371	218	45.35	15	24.659	198	13.31	153
19.9	32.604	233	29.53	15	15.429	286	52.13	220	5.589	240	45.20	28	24.857	224	11.78	120
Mar. 1.9	32.837	253	29.68	5	15.715	325	49.93	170	5.829	262	44.92	41	25.081	246	10.58	83
11.8	33.090	268	29.63	29	16.040	356	48.23	111	6.091	277	44.51	56	25.327	266	9.75	40
21.8	33.358	281	29.34	52	16.396	379	47.12	49	6.368	291	43.95	71	25.593	281	9.35	5
31.8	33.639	291	28.82	75	16.775	392	46.63	12	6.659	302	43.24	83	25.874	291	9.40	48
Apr. 10.8	33.930	295	28.07	94	17.167	396	46.75	76	6.961	307	42.41	94	26.165	296	9.88	92
20.7	34.225	296	27.13	114	17.563	391	47.51	135	7.268	309	41.47	103	26.461	297	10.80	133
30.7	34.521	292	25.99	126	17.954	375	48.86	190	7.577	303	40.44	108	26.758	291	12.13	168
May 10.7	34.813	282	24.73	135	18.329	349	50.76	235	7.880	295	39.36	109	27.049	279	13.81	197
20.7	35.095	264	23.38	141	18.678	316	53.11	276	8.175	279	38.27	107	27.328	261	15.78	220
30.6	35.359	244	21.97	141	18.994	273	55.87	308	8.454	256	37.20	101	27.589	237	17.98	236
June 9.6	35.603	214	20.56	137	19.267	225	58.95	330	8.710	228	36.19	92	27.826	206	20.34	246
19.6	35.817	181	19.19	130	19.492	170	62.25	343	8.938	193	35.27	80	28.032	170	22.80	248
29.5	35.998	144	17.89	118	19.662	112	65.68	347	9.131	154	34.47	66	28.202	131	25.28	245
July 9.5	36.142	101	16.71	105	19.774	49	69.15	344	9.285	110	33.81	52	28.333	88	27.73	235
19.5	36.243	57	15.66	91	19.823	12	72.59	333	9.395	65	33.29	38	28.421	43	30.08	221
29.5	36.300	11	14.75	75	19.811	74	75.92	312	9.460	19	32.91	23	28.464	1	32.29	202
Aug. 8.4	36.311	31	14.00	60	19.737	131	79.04	289	9.479	27	32.68	11	28.463	46	34.31	180
18.4	36.280	73	13.40	44	19.606	185	81.93	255	9.452	70	32.57	1	28.417	87	36.11	154
28.4	36.207	109	12.96	29	19.421	232	84.48	219	9.382	107	32.56	9	28.330	123	37.65	126
Sept. 7.4	36.098	137	12.67	16	19.189	271	86.67	178	9.275	138	32.65	16	28.207	151	38.91	98
17.3	35.961	160	12.51	5	18.918	300	88.45	133	9.137	162	32.81	18	28.056	174	39.89	66
27.3	35.801	171	12.46	7	18.618	318	89.78	85	8.975	175	32.99	22	27.882	187	40.55	34
Oct. 7.3	35.630	173	12.53	17	18.300	324	90.63	34	8.800	179	33.21	23	27.695	190	40.89	3
17.2	35.457	166	12.70	27	17.976	320	90.97	18	8.621	172	33.44	22	27.505	185	40.92	30
27.2	35.291	151	12.97	35	17.656	302	90.79	70	8.449	154	33.66	21	27.320	169	40.62	61
Nov. 6.2	35.140	126	13.32	44	17.354	277	90.09	122	8.295	130	33.87	20	27.151	147	40.01	92
16.2	35.014	95	13.76	51	17.077	240	88.87	171	8.165	99	34.07	19	27.004	118	39.09	123
26.1	34.919	59	14.27	59	16.837	194	87.16	217	8.066	61	34.26	19	26.886	83	37.86	149
Dec. 6.1	34.860	19	14.86	65	16.643	142	84.99	256	8.005	20	34.45	18	26.803	46	36.37	173
16.1	34.841	20	15.51	71	16.501	87	82.43	288	7.985	21	34.63	17	26.757	5	34.64	190
26.1	34.861	59	16.22	73	16.414	26	79.55	311	8.006	62	34.80	16	26.752	35	32.74	203
36.0	34.920		16.95		16.388		76.44		8.068		34.96		26.787		30.71	
Mean Place	32.095		30.39		16.181		58.58		5.044		48.10		24.631		15.13	
Sec δ, Tan δ	1.008		−0.126		1.557		+1.194		1.043		−0.296		1.047		+0.311	
Dψα, Dωα	+0.06		0.00		+0.03		−0.03		+0.07		+0.01		+0.05		−0.01	
Dψδ, *Dωδ*	*+0.2*		*−0.9*		+0.2		−0.9		+0.2		−0.9		+0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	15 Cygni. Mag. 5.0				f Sagittarii. Mag. 5.1				γ Aquilæ. Mag. 2.8				δ Cygni. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 19 41 s		° ′ +37 9 ″		h m 19 41 s		° ′ −19 57 ″		h m 19 42 s		° ′ +10 24 ″		h m 19 42 s		° ′ +44 55 ″	
Jan. 1.0	20.525		37.37		38.058		21.90		24.174		59.33		25.532		65.57	
11.0	20.557	32	34.55	282	38.143	85	21.80	10	24.237	63	57.64	169	25.547	15	62.53	304
21.0	20.636	79	31.70	285	38.267	124	21.66	14	24.336	99	55.97	167	25.616	69	59.44	309
31.0	20.761	125	28.91	279	38.425	158	21.45	21	24.470	134	54.38	159	25.738	122	56.42	302
Feb. 9.9	20.929	168	26.32	259	38.614	189	21.18	27	24.636	166	52.94	144	25.910	172	53.58	284
19.9	21.136	207	24.01	231	38.831	217	20.82	36	24.829	193	51.73	121	26.128	218	51.04	254
Mar. 1.9	21.377	241	22.09	192	39.072	241	20.37	45	25.048	219	50.80	93	26.388	260	48.90	214
11.9	21.649	272	20.64	145	39.335	263	19.80	57	25.289	241	50.22	58	26.684	296	47.25	165
21.8	21.947	298	19.73	91	39.614	279	19.10	70	25.549	260	50.01	21	27.008	324	46.15	110
31.8	22.264	317	19.37	36	39.908	294	18.30	80	25.823	274	50.19	18	27.356	348	45.65	50
Apr. 10.8	22.594	330	19.58	21	40.215	307	17.41	89	26.109	286	50.76	57	27.718	362	45.76	11
20.7	22.929	335	20.36	78	40.527	312	16.44	97	26.401	292	51.69	93	28.085	367	46.47	71
30.7	23.264	335	21.69	133	40.842	315	15.42	102	26.695	294	52.98	129	28.451	366	47.76	129
May 10.7	23.589	325	23.50	181	41.154	312	14.38	104	26.984	289	54.56	158	28.806	355	49.58	182
20.7	23.897	308	25.73	223	41.456	302	13.37	101	27.264	280	56.38	182	29.139	333	51.86	228
30.6	24.183	286	28.33	260	41.743	287	12.41	96	27.527	263	58.39	201	29.444	305	54.53	267
June 9.6	24.437	254	31.18	285	42.007	264	11.53	88	27.767	240	60.53	213	29.714	270	57.51	298
19.6	24.653	216	34.24	306	42.244	237	10.77	76	27.978	211	62.72	219	29.941	227	60.70	319
29.6	24.827	174	37.40	316	42.446	202	10.14	63	28.156	178	64.91	219	30.119	178	64.03	333
July 9.5	24.954	127	40.58	318	42.608	162	9.65	49	28.296	140	67.04	213	30.244	125	67.41	338
19.5	25.031	77	43.72	314	42.726	118	9.32	33	28.393	97	69.08	204	30.313	69	70.76	335
29.5	25.055	24	46.72	300	42.798	72	9.15	17	28.446	53	70.97	189	30.324	11	74.00	324
Aug. 8.4	25.027	28	49.54	282	42.822	24	9.10	5	28.455	9	72.67	170	30.278	46	77.05	305
18.4	24.950	77	52.12	258	42.800	22	9.17	7	28.421	34	74.18	151	30.179	99	79.86	281
28.4	24.826	124	54.40	228	42.733	67	9.34	17	28.346	75	75.45	127	30.028	151	82.36	250
Sept. 7.4	24.662	164	56.34	194	42.627	106	9.59	25	28.235	111	76.48	103	29.834	194	84.52	216
17.3	24.464	198	57.91	157	42.489	138	9.88	29	28.095	140	77.25	77	29.603	231	86.28	176
27.3	24.241	223	59.06	115	42.326	163	10.18	30	27.932	163	77.77	52	29.343	260	87.60	132
Oct. 7.3	24.003	238	59.79	73	42.149	177	10.47	29	27.757	175	78.01	24	29.065	278	88.46	86
17.3	23.758	245	60.06	27	41.967	182	10.74	27	27.577	180	78.00	1	28.780	285	88.84	38
27.2	23.518	240	59.87	19	41.791	176	10.96	22	27.402	175	77.72	28	28.499	281	88.72	12
Nov. 6.2	23.290	228	59.22	65	41.631	160	11.13	17	27.241	161	77.18	54	28.231	268	88.10	62
16.2	23.087	203	58.12	110	41.495	136	11.25	12	27.102	139	76.39	79	27.987	244	86.98	112
26.1	22.915	172	56.58	154	41.392	103	11.33	8	26.992	110	75.36	103	27.777	210	85.38	160
Dec. 6.1	22.779	136	54.63	195	41.325	67	11.37	4	26.914	78	74.10	126	27.606	171	83.33	205
16.1	22.686	93	52.35	228	41.299	26	11.37	0	26.874	40	72.67	143	27.482	124	80.90	243
26.1	22.639	47	49.77	258	41.315	16	11.34	3	26.872	2	71.09	158	27.408	74	78.16	274
36.0	22.639	0	47.00	277	41.373	58	11.29	5	26.909	37	69.41	168	27.387	21	75.20	296
Mean Place	21.362		29.24		38.298		24.54		24.521		53.79		26.649		56.65	
Sec δ, Tan δ	1.255		+0.758		1.064		−0.363		1.017		+0.184		1.413		+0.998	
$D_\psi\alpha$, $D_\omega\alpha$	+0.04		−0.02		+0.07		+0.01		+0.06		−0.01		+0.04		−0.03	
$D_\psi\delta$, $D_\omega\delta$	+0.2		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**δ Sagittæ.** Mag. 3.8				**α Aquilæ.** (*Altair.*) Mag. 0.9				**η Aquilæ.** Var. 3.7–4.4				**ε Draconis.** Mag. 4.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 43		+18 19		19 46		+ 8 39		19 48		+ 0 47		19 48		+70 3	
	s		″		s		″		s		″		s		″	
Jan. 1.0	46.126	55	67.60	208	49.553	64	17.75	156	20.572	66	53.28	114	23.79	13	53.11	326
11.0	46.181	91	65.52	207	49.617	101	16.19	155	20.638	101	52.14	111	23.66	1	49.85	339
21.0	46.272	129	63.45	200	49.718	133	14.64	147	20.739	134	51.03	104	23.65	— 11	46.46	338
31.0	46.401	163	61.45	184	49.851	165	13.17	132	20.873	164	49.99	91	23.76	22	43.08	325
Feb. 9.9	46.564	191	59.61	158	50.016	193	11.85	109	21.037	191	49.08	71	23.98	35	39.83	297
19.9	46.755	220	58.03	125	50.209	219	10.76	82	21.228	217	48.37	49	24.33	44	36.86	258
Mar. 1.9	46.975	244	56.78	87	50.428	240	9.94	50	21.445	238	47.88	22	24.77	52	34.28	210
11.9	47.219	264	55.91	46	50.668	260	9.44	13	21.683	256	47.66	— 7	25.29	60	32.18	154
21.8	47.483	279	55.45	— 1	50.928	274	9.31	— 24	21.939	271	47.73	39	25.89	64	30.64	90
31.8	47.762	291	55.46	46	51.202	285	9.55	62	22.210	283	48.12	70	26.53	68	29.74	27
Apr. 10.8	48.053	298	55.92	90	51.487	293	10.17	97	22.493	291	48.82	97	27.21	68	29.47	— 39
20.7	48.351	299	56.82	131	51.780	294	11.14	130	22.784	293	49.79	123	27.89	67	29.86	103
30.7	48.650	294	58.13	168	52.074	291	12.44	159	23.077	292	51.02	144	28.56	65	30.89	161
May 10.7	48.944	284	59.81	197	52.365	281	14.03	181	23.369	283	52.46	162	29.21	59	32.50	215
20.7	49.228	265	61.78	223	52.646	264	15.84	197	23.652	268	54.08	172	29.80	52	34.65	261
30.6	49.493	242	64.01	239	52.910	243	17.81	210	23.920	247	55.80	178	30.32	45	37.26	300
June 9.6	49.735	211	66.40	249	53.153	214	19.91	214	24.167	220	57.58	180	30.77	35	40.26	328
19.6	49.946	176	68.89	253	53.367	181	22.05	214	24.387	189	59.38	175	31.12	24	43.54	350
29.6	50.122	136	71.42	251	53.548	143	24.19	206	24.576	151	61.13	166	31.36	14	47.04	360
July 9.5	50.258	94	73.93	242	53.691	101	26.25	196	24.727	109	62.79	154	31.50	3	50.64	364
19.5	50.352	48	76.35	227	53.792	58	28.21	182	24.836	66	64.33	140	31.53	— 8	54.28	357
29.5	50.400	2	78.62	209	53.850	12	30.03	162	24.902	22	65.73	122	31.45	18	57.85	344
Aug. 8.4	50.402	— 41	80.71	188	53.862	— 30	31.65	143	24.924	— 22	66.95	103	31.27	30	61.29	323
18.4	50.361	83	82.59	162	53.832	71	33.08	120	24.902	63	67.98	85	30.97	39	64.52	294
28.4	50.278	120	84.21	134	53.761	107	34.28	97	24.839	99	68.83	64	30.58	47	67.46	260
Sept. 7.4	50.158	148	85.55	103	53.654	136	35.25	72	24.740	131	69.47	45	30.11	54	70.06	222
17.3	50.010	173	86.58	73	53.518	159	35.97	47	24.609	152	69.92	26	29.57	59	72.28	176
27.3	49.837	186	87.31	42	53.359	173	36.44	22	24.457	168	70.18	8	28.98	64	74.04	128
Oct. 7.3	49.651	191	87.73	7	53.186	176	36.66	— 3	24.289	172	70.26	— 11	28.34	66	75.32	75
17.3	49.460	186	87.80	— 26	53.010	172	36.63	28	24.117	168	70.15	27	27.68	67	76.07	21
27.2	49.274	173	87.54	59	52.838	158	36.35	51	23.949	155	69.88	44	27.01	65	76.28	— 35
Nov. 6.2	49.101	150	86.95	90	52.680	137	35.84	75	23.794	134	69.44	60	26.36	61	75.93	93
16.2	48.951	122	86.05	122	52.543	108	35.09	97	23.660	105	68.84	75	25.75	57	75.00	147
26.1	48.829	90	84.83	148	52.435	74	34.12	118	23.555	72	68.09	88	25.18	49	73.53	199
Dec. 6.1	48.739	52	83.35	174	52.361	39	32.94	134	23.483	36	67.21	101	24.69	41	71.54	247
16.1	48.687	13	81.61	192	52.322	1	31.60	147	23.447	— 1	66.20	109	24.28	30	69.07	284
26.1	48.674	— 28	79.69	206	52.321	— 38	30.13	157	23.448	40	65.11	116	23.98	20	66.23	317
36.0	48.702		77.63		52.359		28.56		23.488		63.95		23.78		63.06	
Mean Place	46.564		61.18		49.878		12.36		20.833		48.58		27.372		41.73	
Sec δ, Tan δ	1.054		+0.332		1.012		+0.152		1.000		+0.014		2.933		+2.757	
Dψα, Dωα	+0.05		−0.01		+0.06		0.00		+0.06		0.00		0.00		−0.08	
Dψδ, Dωδ	+0.2		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		−0.9	

Washington Mean Time.	ι Sagittarii. Mag. 4.2				ε Pavonis. Mag. 4.1				β Aquilæ. Mag. 3.9				γ Sagittæ. Mag. 3.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 19 49		° ′ −42 4		h m 19 51		° ′ −73 7		h m 19 51		° ′ + 6 12		h m 19 55		° ′ +19 16	
	s		″		s		″		s		″		s		″	
Jan. 1.1	40.059		55.36		12.24		33.68		19.777		18.20		8.844		23.85	
11.0	40.146	87	53.89	147	12.33	9	30.63	305	19.835	58	16.75	145	8.886	42	21.78	207
21.0	40.283	137	52.35	154	12.55	22	27.53	310	19.929	94	15.32	143	8.966	80	19.68	210
31.0	40.466	183	50.78	157	12.91	36	24.48	305	20.057	128	13.96	136	9.083	117	17.66	202
Feb. 9.9	40.690	224	49.21	157	13.39	48	21.52	296	20.216	159	12.76	120	9.234	151	15.79	187
19.9	40.950	260	47.66	155	13.97	58	18.73	279	20.402	186	11.74	102	9.416	182	14.16	163
Mar. 1.9	41.243	293	46.16	150	14.64	67	16.18	255	20.615	213	11.00	74	9.627	211	12.85	131
11.9	41.562	319	44.71	145	15.38	74	13.90	228	20.849	234	10.55	45	9.863	236	11.91	94
21.8	41.906	344	43.35	136	16.19	81	11.95	195	21.104	255	10.45	10	10.121	258	11.41	50
31.8	42.268	362	42.09	126	17.05	86	10.36	159	21.374	270	10.70	25	10.398	277	11.35	6
Apr. 10.8	42.645	377	40.96	113	17.94	89	9.15	121	21.656	282	11.31	61	10.688	290	11.76	41
20.7	43.030	385	39.97	99	18.84	90	8.35	80	21.947	291	12.25	94	10.986	298	12.61	85
30.7	43.420	390	39.15	82	19.75	91	7.97	38	22.241	294	13.50	125	11.288	302	13.89	128
May 10.7	43.806	386	38.54	61	20.64	89	8.01	4	22.533	292	15.00	150	11.587	299	15.54	165
20.7	44.181	375	38.13	41	21.49	85	8.48	47	22.816	283	16.73	173	11.876	289	17.50	196
30.6	44.538	357	37.96	17	22.29	80	9.37	89	23.085	269	18.61	188	12.149	273	19.72	222
June 9.6	44.869	331	38.02	6	23.02	73	10.64	127	23.331	246	20.58	197	12.399	250	22.13	241
19.6	45.164	295	38.33	31	23.66	64	12.27	163	23.551	220	22.59	201	12.620	221	24.66	253
29.6	45.418	254	38.85	52	24.18	52	14.21	194	23.739	188	24.60	201	12.807	187	27.24	258
July 9.5	45.624	206	39.60	75	24.59	41	16.42	221	23.889	150	26.53	193	12.954	147	29.79	255
19.5	45.775	151	40.52	92	24.88	29	18.81	239	23.997	108	28.36	183	13.057	103	32.28	249
29.5	45.868	93	41.59	107	25.02	14	21.32	251	24.062	65	30.04	168	13.116	59	34.64	236
Aug. 8.4	45.901	33	42.78	119	25.01	1	23.87	255	24.082	20	31.55	151	13.129	13	36.81	217
18.4	45.877	24	44.00	122	24.87	14	26.36	249	24.059	23	32.86	131	13.097	32	38.77	196
28.4	45.797	80	45.23	123	24.60	27	28.71	235	23.995	64	33.95	109	13.023	74	40.47	170
Sept. 7.4	45.666	131	46.39	116	24.19	41	30.81	210	23.895	100	34.83	88	12.911	112	41.91	144
17.3	45.492	174	47.43	104	23.69	50	32.59	178	23.763	132	35.46	63	12.768	143	43.04	113
27.3	45.285	207	48.32	89	23.10	59	33.97	138	23.609	154	35.87	41	12.600	168	43.85	81
Oct. 7.3	45.057	228	48.98	66	22.45	65	34.89	92	23.440	169	36.05	18	12.417	183	44.35	50
17.3	44.821	236	49.39	41	21.78	67	35.30	41	23.265	175	36.01	4	12.227	190	44.50	15
27.2	44.588	233	49.53	14	21.10	68	35.18	12	23.094	171	35.73	28	12.040	187	44.32	18
Nov. 6.2	44.373	215	49.38	15	20.46	64	34.51	67	22.937	157	35.25	48	11.864	176	43.81	51
16.2	44.186	187	48.96	42	19.87	59	33.32	119	22.799	138	34.54	71	11.709	155	42.96	85
26.1	44.037	149	48.27	69	19.37	50	31.64	168	22.689	110	33.64	90	11.580	129	41.79	117
Dec. 6.1	43.933	104	47.36	91	18.98	39	29.52	212	22.610	79	32.56	108	11.482	98	40.34	145
16.1	43.880	53	46.23	113	18.71	27	27.05	247	22.567	43	31.31	125	11.420	62	38.63	171
26.1	43.880	0	44.96	127	18.58	13	24.30	275	22.562	5	29.94	137	11.397	23	36.73	190
36.0	43.933	53	43.56	140	18.57	1	21.35	295	22.595	33	28.50	144	11.413	16	34.67	206
Mean Place	40.496		56.15		14.672		33.22		20.069		12.83		9.266		16.80	
Sec δ, Tan δ	1.347		−0.903		3.444		−3.296		1.006		+0.109		1.059		+0.350	
$D_\psi \alpha$, $D_\omega \alpha$	+0.08		+0.03		+0.14		+0.10		+0.06		0.00		+0.05		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.2		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Sagittarii. Mag. 4.6				τ Aquilæ. Mag. 5.6				θ Aquilæ. Mag. 3.4				ο Cygni, *seq.* Mag. 4.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 19 57 s		° ′ −27 55 ″		h m 20 0 s		° ′ + 7 2 ″		h m 20 7 s		° ′ − 1 3 ″		h m 20 11 s		° ′ +46 29 ″	
Jan. 1.1	40.534	73	68.23	63	10.718	49	61.21	145	7.348	48	40.55	99	3.863	26	53.75	293
11.0	40.607	112	67.60	70	10.767	85	59.76	144	7.396	84	41.54	95	3.837	— 29	50.82	306
21.0	40.719	150	66.90	75	10.852	119	58.32	137	7.480	117	42.49	89	3.866	82	47.76	303
31.0	40.869	184	66.15	81	10.971	150	56.95	122	7.597	147	43.38	75	3.948	135	44.73	293
Feb. 10.0	41.053	215	65.34	87	11.121	179	55.73	103	7.744	176	44.13	58	4.083	186	41.80	268
19.9	41.268	242	64.47	93	11.300	206	54.70	77	7.920	203	44.71	37	4.269	232	39.12	233
Mar. 1.9	41.510	268	63.54	98	11.505	228	53.93	47	8.123	225	45.08	11	4.501	275	36.79	188
11.9	41.778	286	62.56	104	11.733	250	53.46	11	8.348	247	45.19	— 17	4.776	311	34.91	136
21.8	42.064	306	61.52	107	11.983	266	53.35	— 24	8.595	264	45.02	45	5.087	341	33.55	79
31.8	42.370	319	60.45	109	12.249	280	53.59	60	8.859	279	44.57	75	5.428	361	32.76	19
Apr. 10.8	42.689	329	59.36	109	12.529	290	54.19	93	9.138	290	43.82	100	5.789	375	32.57	— 44
20.8	43.018	334	58.27	105	12.819	294	55.12	126	9.428	296	42.82	126	6.164	380	33.01	101
30.7	43.352	333	57.22	99	13.113	294	56.38	154	9.724	296	41.56	145	6.544	374	34.02	156
May 10.7	43.685	326	56.23	89	13.407	286	57.92	175	10.020	291	40.11	161	6.918	360	35.58	206
20.7	44.011	312	55.34	78	13.693	273	59.67	191	10.311	279	38.50	170	7.278	336	37.64	250
30.7	44.323	291	54.56	61	13.966	252	61.58	203	10.590	260	36.80	175	7.614	303	40.14	284
June 9.6	44.614	263	53.95	46	14.218	227	63.61	208	10.850	236	35.05	176	7.917	263	42.98	312
19.6	44.877	228	53.49	26	14.445	194	65.69	207	11.086	204	33.29	170	8.180	216	46.10	330
29.6	45.105	188	53.23	9	14.639	157	67.76	201	11.290	168	31.59	161	8.396	165	49.40	340
July 9.5	45.293	142	53.14	— 9	14.796	116	69.77	191	11.458	127	29.98	149	8.561	106	52.80	342
19.5	45.435	92	53.23	26	14.912	73	71.68	177	11.585	84	28.49	134	8.667	48	56.22	337
29.5	45.527	42	53.49	39	14.985	28	73.45	158	11.669	40	27.15	116	8.715	— 10	59.59	323
Aug. 8.5	45.569	— 8	53.88	51	15.013	— 16	75.03	140	11.709	— 5	25.99	97	8.705	68	62.82	302
18.4	45.561	56	54.39	59	14.997	57	76.43	116	11.704	46	25.02	78	8.637	122	65.84	276
28.4	45.505	100	54.98	62	14.940	94	77.59	95	11.658	85	24.24	60	8.515	170	68.60	244
Sept. 7.4	45.405	136	55.60	62	14.846	127	78.54	70	11.573	118	23.64	41	8.345	213	71.04	207
17.4	45.269	166	56.22	58	14.719	150	79.24	48	11.455	142	23.23	22	8.132	246	73.11	166
27.3	45.103	183	56.80	50	14.569	167	79.72	23	11.313	161	23.01	6	7.886	270	74.77	121
Oct. 7.3	44.920	192	57.30	40	14.402	174	79.95	0	11.152	167	22.95	— 10	7.616	283	75.98	74
17.3	44.728	189	57.70	26	14.228	171	79.95	23	10.985	165	23.05	27	7.333	286	76.72	23
27.2	44.539	176	57.96	14	14.057	159	79.72	45	10.820	157	23.32	40	7.047	280	76.95	— 27
Nov. 6.2	44.363	152	58.10	— 1	13.898	141	79.27	68	10.663	138	23.72	54	6.767	260	76.68	79
16.2	44.211	122	58.09	14	13.757	115	78.59	87	10.525	112	24.26	68	6.507	236	75.89	129
26.2	44.089	84	57.95	28	13.642	84	77.72	107	10.413	82	24.94	78	6.271	199	74.60	176
Dec. 6.1	44.005	43	57.67	39	13.558	50	76.65	124	10.331	50	25.72	88	6.072	158	72.84	219
16.1	43.962	1	57.28	48	13.508	13	75.41	135	10.281	13	26.60	96	5.914	111	70.65	255
26.1	43.961	— 43	56.80	55	13.495	— 24	74.06	145	10.268	— 24	27.56	99	5.803	61	68.10	282
36.1	44.004		56.25		13.519		72.61		10.292		28.55		5.742		65.28	
Mean Place	40.791		69.93		10.997		55.49		7.563		45.36		4.912		42.42	
Sec δ, Tan δ	1.132		−0.530		1.008		+0.124		1.000		−0.018		1.453		+1.054	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.07		+0.02		+0.06		0.00		+0.06		0.00		+0.04		−0.04	
$D_{\omega}\delta$	*+0.2*		*−0.9*		+0.2		−0.9		+0.2		−0.9		+0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Cephei. Mag. 4.4				24 Vulpeculæ. Mag. 5.4				α² Capricorni. Mag. 3.8				β Capricorni. Mag. 3.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 11		+77 27		20 13		+24 25		20 13		−12 47		20 16		−15 1	
	s		″		s		″		s		″		s		″	
Jan. 1.1	32.71		79.12		18.699		23.60		33.526		45.21		27.573		74.04	
11.0	32.36	35	76.04	308	18.718	19	21.37	223	33.575	49	45.49	28	27.621	48	74.18	14
21.0	32.18	18	72.76	328	18.775	57	19.09	228	33.661	86	45.71	22	27.704	83	74.26	8
31.0	32.21	3	69.42	334	18.869	94	16.85	224	33.780	119	45.86	15	27.822	118	74.25	1
Feb. 10.0	32.42	21	66.13	329	19.001	132	14.76	209	33.930	150	45.90	4	27.971	149	74.15	10
19.9	32.81	39	63.04	309	19.167	166	12.88	188	34.108	178	45.81	9	28.149	178	73.91	24
Mar. 1.9	33.38	57	60.24	280	19.365	198	11.32	156	34.313	205	45.55	26	28.354	205	73.54	37
11.9	34.10	72	57.88	236	19.591	226	10.15	117	34.543	230	45.12	43	28.583	229	72.99	55
21.8	34.94	84	56.04	184	19.845	254	9.41	74	34.794	251	44.50	62	28.835	252	72.28	71
31.8	35.89	95	54.77	127	20.119	274	9.15	26	35.064	270	43.71	79	29.106	271	71.42	86
Apr. 10.8	36.90	101	54.12	65	20.411	292	9.38	23	35.349	285	42.74	97	29.393	287	70.40	102
20.8	37.94	104	54.13	1	20.716	305	10.09	71	35.647	298	41.61	113	29.692	299	69.24	116
30.7	38.97	103	54.76	63	21.026	310	11.27	118	35.953	306	40.37	124	30.000	308	67.99	125
May 10.7	39.96	99	56.00	124	21.336	310	12.87	160	36.260	307	39.03	134	30.309	309	66.68	131
20.7	40.88	92	57.80	180	21.637	301	14.84	197	36.562	302	37.65	138	30.615	306	65.34	134
30.7	41.71	83	60.11	231	21.925	288	17.10	226	36.854	292	36.28	137	30.911	296	64.01	133
June 9.6	42.43	72	62.84	273	22.190	265	19.61	251	37.129	275	34.95	133	31.190	279	62.75	126
19.6	43.01	58	65.92	308	22.428	238	22.28	267	37.379	250	33.69	126	31.444	254	61.59	116
29.6	43.42	41	69.26	334	22.631	203	25.03	275	37.598	219	32.56	113	31.668	224	60.54	105
July 9.5	43.68	26	72.79	353	22.793	162	27.81	278	37.781	183	31.55	101	31.858	190	59.66	88
19.5	43.78	10	76.40	361	22.913	120	30.55	274	37.923	142	30.70	85	32.005	147	58.93	73
29.5	43.69	9	80.02	362	22.985	72	33.17	262	38.021	98	30.04	66	32.107	102	58.37	56
Aug. 8.5	43.45	24	83.56	354	23.011	26	35.64	247	38.073	52	29.54	50	32.163	56	58.00	37
18.4	43.04	41	86.96	340	22.991	20	37.90	226	38.079	6	29.20	34	32.172	9	57.80	20
28.4	42.47	57	90.15	319	22.926	65	39.90	200	38.040	39	29.02	18	32.136	36	57.74	6
Sept. 7.4	41.78	69	93.04	289	22.821	105	41.62	172	37.961	79	28.98	4	32.059	77	57.80	6
17.4	40.97	81	95.58	254	22.682	139	43.04	142	37.848	113	29.05	7	31.947	112	57.97	17
27.3	40.06	91	97.72	214	22.516	166	44.12	108	37.708	140	29.21	16	31.807	140	58.23	26
Oct. 7.3	39.07	99	99.41	169	22.331	185	44.84	72	37.548	160	29.46	25	31.647	160	58.53	30
17.3	38.03	104	100.60	119	22.137	194	45.20	36	37.379	169	29.75	29	31.478	169	58.87	34
27.2	36.96	107	101.26	66	21.942	195	45.19	1	37.211	168	30.07	32	31.308	170	59.21	34
Nov. 6.2	35.90	106	101.36	10	21.754	188	44.80	39	37.053	158	30.42	35	31.148	160	59.55	34
16.2	34.87	103	100.88	48	21.584	170	44.03	77	36.912	141	30.77	35	31.004	144	59.87	32
26.2	33.90	97	99.84	104	21.437	147	42.90	113	36.797	115	31.14	37	30.887	117	60.18	31
Dec. 6.1	33.01	89	98.25	159	21.319	118	41.45	145	36.712	85	31.50	36	30.799	88	60.46	28
16.1	32.24	77	96.14	211	21.235	84	39.69	176	36.661	51	31.87	37	30.747	52	60.72	26
26.1	31.61	63	93.59	255	21.187	48	37.70	199	36.648	13	32.22	35	30.731	16	60.95	23
36.1	31.15	46	90.66	293	21.180	7	35.52	218	36.672	24	32.54	32	30.753	22	61.14	19
Mean Place	38.590		65.02		19.143		15.00		33.706		48.47		27.746		77.00	
Sec δ, Tan δ	4.610		+4.500		1.098		+0.454		1.025		−0.227		1.035		−0.269	
$D_\psi\alpha$, $D_\omega\alpha$	−0.04		−0.16		+0.05		−0.02		+0.07		+0.01		+0.07		+0.01	
$D_\psi\delta$, $D_\omega\delta$	+0.2		−0.8		+0.2		−0.8		+0.2		−0.8		+0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Pavonis. Mag. 2.1				γ Cygni. Mag. 2.3				π Capricorni. Mag. 5.2				ρ Capricorni. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 20 19		° ′ −56 59		h m 20 19		° ′ +39 59		h m 20 22		° ′ −18 28		h m 20 24		° ′ −18 4	
	s		″		s		″		s		″		s		″	
Jan. 1.1	14.016	39	46.69	229	18.484	18	59.47	273	41.017	42	38.49	7	14.376	41	53.99	6
11.0	14.055	106	44.40	241	18.466	31	56.74	284	41.059	79	38.42	15	14.417	77	53.93	12
21.0	14.161	171	41.99	248	18.497	77	53.90	284	41.138	114	38.27	24	14.494	112	53.81	22
31.0	14.332	232	39.51	249	18.574	123	51.06	272	41.252	144	38.03	34	14.606	142	53.59	32
Feb. 10.0	14.564	287	37.02	244	18.697	168	48.34	250	41.396	176	37.69	45	14.748	174	53.27	43
19.9	14.851	336	34.58	235	18.865	209	45.84	216	41.572	204	37.24	58	14.922	202	52.84	57
Mar. 1.9	15.187	380	32.23	222	19.074	247	43.68	175	41.776	229	36.66	73	15.124	226	52.27	72
11.9	15.567	420	30.01	203	19.321	280	41.93	125	42.005	252	35.93	86	15.350	251	51.55	85
21.9	15.987	453	27.98	183	19.601	309	40.68	71	42.257	272	35.07	99	15.601	270	50.70	99
31.8	16.440	477	26.15	157	19.910	329	39.97	13	42.529	289	34.08	113	15.871	288	49.71	113
Apr. 10.8	16.917	498	24.58	130	20.239	344	39.84	45	42.818	304	32.95	121	16.159	303	48.58	121
20.8	17.415	507	23.28	100	20.583	352	40.29	101	43.122	312	31.74	128	16.462	311	47.37	129
30.7	17.922	508	22.28	67	20.935	348	41.30	153	43.434	316	30.46	130	16.773	315	46.08	132
May 10.7	18.430	501	21.61	32	21.283	340	42.83	200	43.750	313	29.16	130	17.088	312	44.76	131
20.7	18.931	480	21.29	2	21.623	320	44.83	241	44.063	303	27.86	125	17.400	303	43.45	127
30.7	19.411	451	21.31	39	21.943	293	47.24	273	44.366	287	26.61	115	17.703	287	42.18	118
June 9.6	19.862	408	21.70	73	22.236	258	49.97	300	44.653	263	25.46	106	17.990	264	41.00	107
19.6	20.270	358	22.43	105	22.494	218	52.97	317	44.916	234	24.40	90	18.254	234	39.93	92
29.6	20.628	298	23.48	134	22.712	171	56.14	325	45.150	197	23.50	71	18.488	198	39.01	75
July 9.6	20.926	227	24.82	160	22.883	120	59.39	327	45.347	155	22.79	55	18.686	157	38.26	57
19.5	21.153	153	26.42	177	23.003	67	62.66	321	45.502	111	22.24	36	18.843	111	37.69	39
29.5	21.306	76	28.19	192	23.070	13	65.87	307	45.613	63	21.88	18	18.954	65	37.30	20
Aug. 8.5	21.382	5	30.11	199	23.083	40	68.94	288	45.676	15	21.70	2	19.019	17	37.10	5
18.4	21.377	82	32.10	197	23.043	91	71.82	262	45.691	30	21.68	13	19.036	29	37.05	11
28.4	21.295	153	34.07	187	22.952	136	74.44	232	45.661	73	21.81	25	19.007	72	37.16	23
Sept 7.4	21.142	217	35.94	168	22.816	175	76.76	197	45.588	110	22.06	33	18.935	108	37.39	31
17.4	20.925	269	37.62	146	22.641	208	78.73	157	45.478	138	22.39	38	18.827	138	37.70	38
27.3	20.656	307	39.08	113	22.433	230	80.30	115	45.340	161	22.77	41	18.689	159	38.08	40
Oct. 7.3	20.349	329	40.21	76	22.203	243	81.45	71	45.179	171	23.18	40	18.530	170	38.48	41
17.3	20.020	335	40.97	36	21.960	247	82.16	24	45.008	173	23.58	39	18.360	172	38.89	38
27.3	19.685	325	41.33	7	21.713	241	82.40	24	44.835	163	23.97	34	18.188	163	39.27	35
Nov. 6.2	19.360	297	41.26	48	21.472	226	82.16	72	44.672	148	24.31	29	18.025	148	39.62	30
16.2	19.063	257	40.78	92	21.246	201	81.44	118	44.524	123	24.60	22	17.877	123	39.92	25
26.2	18.806	205	39.86	130	21.045	171	80.26	163	44.401	93	24.82	17	17.754	94	40.17	18
Dec. 6.1	18.601	144	38.56	165	20.874	134	78.63	204	44.308	57	24.99	11	17.660	59	40.35	13
16.1	18.457	78	36.91	192	20.740	93	76.59	236	44.251	21	25.10	6	17.601	22	40.48	7
26.1	18.379	9	34.99	217	20.647	47	74.23	264	44.230	17	25.16	1	17.579	14	40.55	2
36.1	18.370		32.82		20.600		71.59		44.247		25.15		17.593		40.57	
Mean Place	14.863		45.18		19.253		48.36		41.186		40.92		14.539		56.46	
Sec δ, Tan δ	1.836		−1.539		1.305		+0.839		1.054		−0.334		1.052		−0.326	
Dψa, Dωa	+0.09		+0.06		+0.04		−0.03		+0.07		+0.01		+0.07		+0.01	
Dψδ, Dωδ	+0.2		−0.8		+0.2		−0.8		+0.2		−0.8		+0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	41 Cygni. Mag. 4.1				θ Cephei. Mag. 4.3				ε Delphini. Mag. 4.0				Groombridge 3241. Mag. 6.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 20 26		° ′ +30 5		h m 20 28		° ′ +62 43		h m 20 29		° ′ +11 1		h m 20 30		° ′ +72 15	
	s		″		s		″		s		″		s		″	
Jan. 1.1	4.707	4 —	61.43	238	11.51	14	31.84	303	20.379	19	44.82	156	18.45	27	41.91	300
11.0	4.703	37	59.05	247	11.37	5 —	28.81	322	20.398	55	43.26	158	18.18	14	38.91	322
21.0	4.740	78	56.58	246	11.32	3	25.59	331	20.453	85	41.68	153	18.04	2 —	35.69	334
31.0	4.818	117	54.12	234	11.35	11	22.28	325	20.538	120	40.15	140	18.02	12	32.35	331
Feb. 10.0	4.935	154	51.78	212	11.46	20	19.03	307	20.658	151	38.75	121	18.14	26	29.04	316
19.9	5.089	190	49.66	183	11.66	29	15.96	277	20.809	179	37.54	96	18.40	37	25.88	289
Mar. 1.9	5.279	223	47.83	144	11.95	34	13.19	236	20.988	208	36.58	63	18.77	48	22.99	249
11.9	5.502	252	46.39	98	12.29	41	10.83	185	21.196	231	35.95	29 —	19.25	58	20.50	200
21.9	5.754	277	45.41	49 —	12.70	47	8.98	126	21.427	255	35.66	9	19.83	67	18.50	143
31.8	6.031	299	44.92	4	13.17	49	7.72	65	21.682	272	35.75	47	20.50	72	17.07	82
Apr. 10.8	6.330	313	44.96	56	13.66	53	7.07	1 —	21.954	287	36.22	86	21.22	75	16.25	19 —
20.8	6.643	321	45.52	105	14.19	53	7.06	62	22.241	296	37.08	121	21.97	76	16.06	46
30.7	6.964	322	46.57	152	14.72	53	7.68	124	22.537	300	38.29	153	22.73	75	16.52	108
May 10.7	7.286	317	48.09	195	15.25	50	8.92	180	22.837	297	39.82	179	23.48	71	17.60	166
20.7	7.603	301	50.04	228	15.75	47	10.72	231	23.134	287	41.61	201	24.19	65	19.26	218
30.7	7.904	281	52.32	258	16.22	42	13.03	274	23.421	270	43.62	215	24.84	58	21.44	264
June 9.6	8.185	252	54.90	278	16.64	36	15.77	310	23.691	246	45.77	224	25.42	49	24.08	301
19.6	8.437	216	57.68	292	17.00	30	18.87	335	23.937	216	48.01	227	25.91	39	27.09	331
29.6	8.653	176	60.60	297	17.30	21	22.22	355	24.153	181	50.28	224	26.30	27	30.40	352
July 9.6	8.829	131	63.57	298	17.51	13	25.77	364	24.334	142	52.52	217	26.57	16	33.92	364
19.5	8.960	83	66.55	288	17.64	6 —	29.41	366	24.476	97	54.69	203	26.73	3 —	37.56	368
29.5	9.043	34 —	69.43	274	17.70	3	33.07	358	24.573	53	56.72	187	26.76	9	41.24	364
Aug. 8.5	9.077	15	72.17	254	17.67	11	36.65	343	24.626	8 —	58.59	166	26.67	21	44.88	350
18.4	9.062	61	74.71	230	17.56	20	40.08	322	24.634	35	60.25	145	26.46	32	48.38	332
28.4	9.001	104	77.01	201	17.36	26	43.30	292	24.599	75	61.70	120	26.14	42	51.70	305
Sept. 7.4	8.897	139	79.02	169	17.10	33	46.22	258	24.524	109	62.90	96	25.72	51	54.75	272
17.4	8.758	170	80.71	133	16.77	37	48.80	217	24.415	136	63.86	70	25.21	59	57.47	235
27.3	8.588	191	82.04	97	16.40	42	50.97	172	24.279	156	64.56	44	24.62	66	59.82	188
Oct. 7.3	8.397	204	83.01	56	15.98	44	52.69	123	24.123	168	65.00	16 —	23.96	70	61.70	139
17.3	8.193	207	83.57	16 —	15.54	46	53.92	70	23.955	171	65.16	9	23.26	72	63.09	88
27.3	7.986	202	83.73	26	15.08	46	54.62	14 —	23.784	163	65.07	36	22.54	73	63.97	31 —
Nov. 6.2	7.784	188	83.47	67	14.62	45	54.76	42	23.621	150	64.71	62	21.81	71	64.28	26
16.2	7.596	166	82.80	108	14.17	41	54.34	100	23.471	130	64.09	84	21.10	68	64.02	84
26.2	7.430	139	81.72	144	13.76	37	53.34	154	23.341	103	63.25	108	20.42	62	63.18	142
Dec. 6.1	7.291	105	80.28	180	13.39	33	51.80	205	23.238	73	62.17	127	19.80	54	61.76	195
16.1	7.186	69	78.48	209	13.06	26	49.75	251	23.165	41	60.90	142	19.26	45	59.81	241
26.1	7.117	30	76.39	231	12.80	18	47.24	286	23.124	6	59.48	154	18.81	35	57.40	283
36.1	7.087		74.08		12.62		44.38		23.118		57.94		18.46		54.57	
Mean Place	5.201		51.33		13.538		17.36		20.610		37.66		22.041		26.42	
Sec δ, Tan δ	1.156		+0.580		2.182		+1.940		1.019		+0.195		3.283		+3.126	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		−0.02		+0.02		−0.08		+0.06		−0.01		0.00		−0.13	
$D_\psi \delta$, $D_\omega \delta$	+0.2		−0.8		+0.2		−0.8		+0.2		−0.8		+0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Indi. Mag. 3.2				β Delphini. Mag. 3.7				υ Capricorni. Mag. 5.3				α Delphini. Mag. 3.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 20 31 s		° ′ −47 34 ″		h m 20 33 s		° ′ +14 18 ″		h m 20 35 s		° ′ −18 25 ″		h m 20 35 s		° ′ +15 37 ″	
Jan. 1.1	51.921		31.84		44.836		53.14		26.299		26.02		52.311		41.01	
11.1	51.948	27	30.07	177	44.848	12	51.44	170	26.328	29	25.94	8	52.320	9	39.25	176
21.0	52.028	80	28.15	192	44.894	46	49.70	174	26.394	66	25.77	17	52.362	42	37.46	179
31.0	52.158	130	26.13	202	44.975	81	48.01	169	26.493	99	25.50	27	52.440	78	35.70	176
Feb. 10.0	52.336	178	24.05	208	45.089	114	46.44	157	26.625	132	25.13	37	52.551	111	34.07	163
19.9	52.559	223	21.96	209	45.234	145	45.05	139	26.788	163	24.64	49	52.694	143	32.62	145
Mar. 1.9	52.822	263	19.88	208	45.410	176	43.94	111	26.978	190	24.00	64	52.869	175	31.44	118
11.9	53.123	301	17.86	202	45.615	205	43.15	79	27.196	218	23.22	78	53.072	203	30.59	85
21.9	53.455	332	15.92	194	45.845	230	42.71	44	27.438	242	22.30	92	53.301	229	30.11	48
31.8	53.818	363	14.11	181	46.100	255	42.69	2 —	27.704	266	21.24	106	53.556	255	30.04	7 —
Apr. 10.8	54.204	386	12.47	164	46.373	273	43.08	39	27.987	283	20.04	120	53.829	273	30.38	34
20.8	54.610	406	11.00	147	46.661	288	43.87	79	28.288	301	18.76	128	54.117	288	31.15	77
30.8	55.028	418	9.77	123	46.959	298	45.04	117	28.599	311	17.42	134	54.416	299	32.30	115
May 10.7	55.451	423	8.77	100	47.261	302	46.57	153	28.915	316	16.03	139	54.721	305	33.82	152
20.7	55.871	420	8.06	71	47.561	300	48.37	180	29.231	316	14.66	137	55.021	300	35.63	181
30.7	56.278	407	7.64	42	47.851	290	50.43	206	29.538	307	13.34	132	55.312	291	37.71	208
June 9.6	56.665	387	7.53	11 —	48.125	274	52.67	224	29.832	294	12.11	123	55.588	276	39.97	226
19.6	57.021	356	7.74	21	48.374	249	55.01	234	30.104	272	11.01	110	55.838	250	42.35	238
29.6	57.337	316	8.24	50	48.593	219	57.41	240	30.346	242	10.06	95	56.059	221	44.80	245
July 9.6	57.605	268	9.04	80	48.778	185	59.80	239	30.553	207	9.29	77	56.246	187	47.25	245
19.5	57.819	214	10.11	107	48.922	144	62.13	233	30.720	167	8.69	60	56.391	145	49.64	239
29.5	57.971	152	11.38	127	49.022	100	64.33	220	30.842	122	8.29	40	56.492	101	51.91	227
Aug. 8.5	58.058	87	12.82	144	49.078	56	66.37	204	30.917	75	8.09	20	56.549	57	54.03	212
18.5	58.081	23 —	14.38	156	49.087	9 —	68.23	186	30.944	27 —	8.05	4 —	56.559	10 —	55.95	192
28.4	58.040	41	15.98	160	49.055	32	69.85	162	30.925	19	8.18	13	56.527	32	57.64	169
Sept. 7.4	57.938	102	17.57	159	48.981	74	71.23	138	30.863	62	8.44	26	56.453	74	59.09	145
17.4	57.783	155	19.07	150	48.873	108	72.33	110	30.764	99	8.79	35	56.345	108	60.27	118
27.3	57.583	200	20.41	134	48.736	137	73.17	84	30.632	132	9.20	41	56.209	136	61.17	90
Oct. 7.3	57.352	231	21.52	111	48.578	158	73.72	55	30.479	153	9.65	45	56.050	159	61.77	60
17.3	57.100	252	22.36	84	48.409	169	73.97	25 —	30.312	167	10.11	46	55.880	170	62.06	29
27.3	56.841	259	22.88	52	48.237	172	73.95	2	30.141	171	10.53	42	55.706	174	62.07	1 —
Nov. 6.2	56.589	252	23.06	18 —	48.070	167	73.62	33	29.977	164	10.92	39	55.537	169	61.77	30
16.2	56.356	233	22.88	18	47.915	155	73.02	60	29.827	150	11.26	34	55.381	156	61.16	61
26.2	56.154	202	22.36	52	47.780	135	72.14	88	29.699	128	11.53	27	55.243	138	60.29	87
Dec. 6.2	55.993	161	21.50	86	47.671	109	71.01	113	29.599	100	11.73	20	55.131	112	59.14	115
16.1	55.878	115	20.34	116	47.592	79	69.67	134	29.532	67	11.86	13	55.049	82	57.77	137
26.1	55.814	64	18.92	142	47.544	48	68.13	154	29.500	32 —	11.93	7 —	54.998	51	56.19	158
36.1	55.804	10	17.28	164	47.531	13	66.45	168	29.503	3	11.92	1	54.982	16	54.47	172
Mean Place	52.417		30.48		45.081		45.29		26.440		28.32		52.561		32.85	
Sec δ, Tan δ	1.482		−1.094		1.032		+0.255		1.054		−0.333		1.038		+0.280	
Dψα, Dωα	+0.08		+0.04		+0.06		−0.01		+0.07		+0.01		+0.06		−0.01	
ψδ, Dωδ	+0.2		−0.8		+0.2		−0.8		+0.2		−0.8		+0.3		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Pavonis. Mag. 3.6				α Cygni. (*Deneb.*) Mag. 1.3				δ Delphini. Mag. 4.5				ψ Capricorni. Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 20 37		° ′ −66 29		h m 20 38		° ′ +44 59		h m 20 39		° ′ +14 46		h m 20 41		° ′ −25 33	
	s		″		s		″		s		″		s		″	
Jan. 1.1	39.11		47.49		39.379		38.08		40.420		67.34		18.004		44.44	
11.1	39.09	2	44.79	270	39.325	54	35.35	273	40.426	6	65.64	170	18.029	25	43.94	50
21.0	39.16	7	41.92	287	39.322	3	32.45	290	40.466	40	63.91	173	18.091	62	43.34	60
31.0	39.32	16	38.95	297	39.370	48	29.50	295	40.541	75	62.21	170	18.188	97	42.61	73
Feb. 10.0	39.56	24	35.96	299	39.468	98	26.62	288	40.649	108	60.63	158	18.320	132	41.78	83
19.9	39.88	32	33.02	294	39.616	148	23.93	269	40.788	139	59.22	141	18.484	164	40.85	93
Mar. 1.9	40.28	40	30.19	283	39.812	196	21.53	240	40.958	170	58.08	114	18.678	194	39.81	104
11.9	40.74	46	27.53	266	40.053	241	19.53	200	41.158	200	57.26	82	18.902	224	38.66	115
21.9	41.27	53	25.08	245	40.332	279	18.00	153	41.384	226	56.80	46	19.152	250	37.43	123
31.8	41.84	57	22.91	217	40.648	316	17.01	99	41.634	250	56.75	5	19.424	272	36.12	131
Apr. 10.8	42.45	61	21.03	188	40.991	343	16.61	40	41.905	271	57.10	35	19.718	294	34.75	137
20.8	43.10	65	19.50	153	41.353	362	16.80	19	42.191	286	57.87	77	20.029	311	33.36	139
30.8	43.76	66	18.34	116	41.726	373	17.56	76	42.489	298	59.02	115	20.352	323	31.97	139
May 10.7	44.42	66	17.59	75	42.101	375	18.89	133	42.791	302	60.52	150	20.682	330	30.62	135
20.7	45.08	66	17.24	35	42.469	368	20.72	183	43.091	300	62.31	179	21.012	330	29.35	127
30.7	45.72	64	17.32	8	42.819	350	23.01	229	43.384	293	64.37	206	21.336	324	28.20	115
June 9.6	46.32	60	17.81	49	43.143	324	25.68	267	43.661	277	66.61	224	21.644	308	27.19	101
19.6	46.88	56	18.72	91	43.432	289	28.66	298	43.914	253	68.96	235	21.932	288	26.36	83
29.6	47.35	47	20.01	129	43.679	247	31.85	319	44.138	224	71.38	242	22.190	258	25.73	63
July 9.6	47.76	41	21.63	162	43.878	199	35.19	334	44.328	190	73.80	242	22.412	222	25.30	43
19.5	48.09	33	23.55	192	44.023	145	38.58	339	44.477	149	76.15	235	22.593	181	25.11	19
29.5	48.31	22	25.70	215	44.111	88	41.95	337	44.583	106	78.39	224	22.727	134	25.12	1
Aug. 8.5	48.43	12	28.00	230	44.142	31	45.24	329	44.643	60	80.47	208	22.812	85	25.33	21
18.5	48.44	1	30.38	238	44.116	26	48.35	311	44.659	16	82.36	189	22.847	35	25.71	38
28.4	48.35	9	32.75	237	44.036	80	51.24	289	44.630	29	84.02	166	22.833	14	26.23	52
Sept. 7.4	48.16	19	35.01	226	43.905	131	53.85	261	44.561	69	85.44	142	22.773	60	26.86	63
17.4	47.88	28	37.08	207	43.730	175	56.12	227	44.456	105	86.58	114	22.671	102	27.54	68
27.3	47.52	36	38.87	179	43.518	212	58.01	189	44.324	132	87.46	88	22.538	133	28.24	70
Oct. 7.3	47.10	42	40.31	144	43.279	239	59.48	147	44.169	155	88.04	58	22.378	160	28.92	68
17.3	46.64	46	41.31	100	43.020	259	60.49	101	44.001	168	88.33	29	22.203	175	29.54	62
27.3	46.17	47	41.85	54	42.753	267	61.02	53	43.829	172	88.34	1	22.023	180	30.07	53
Nov. 6.2	45.69	48	41.88	3	42.488	265	61.05	3	43.662	167	88.05	29	21.847	176	30.47	40
16.2	45.25	44	41.39	49	42.235	253	60.57	48	43.505	157	87.47	58	21.687	160	30.73	27
26.2	44.84	41	40.41	98	42.000	235	59.59	98	43.367	138	86.62	85	21.547	140	30.86	13
Dec. 6.2	44.51	33	38.95	146	41.795	205	58.14	145	43.255	112	85.51	111	21.437	110	30.85	1
16.1	44.24	27	37.08	187	41.624	171	56.24	190	43.172	83	84.18	133	21.361	76	30.70	15
26.1	44.06	18	34.84	224	41.494	130	53.95	229	43.119	53	82.66	152	21.321	40	30.41	29
36.1	43.97	9	32.29	255	41.408	86	51.34	261	43.101	18	80.99	167	21.318	3	30.01	40
Mean Place	40.560		44.46		40.208		24.97		40.646		59.21		18.163		45.55	
Sec δ, Tan δ	2.508		−2.300		1.414		+1.000		1.034		+0.264		1.108		−0.478	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.11		+0.10		+0.04		−0.04		+0.06		−0.01		+0.07		+0.02	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		−0.8		+0.3		−0.8		+0.3		−0.8		+0.3		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Delphini *seq.* Mag. 4.5				ε Cygni. Mag. 2.6				ε Aquarii. Mag. 3.8				η Cephei. Mag. 3.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 20 42		° ′ +15 49		h m 20 42		° ′ +33 39		h m 20 43		° ′ − 9 47		h m 20 43		° ′ +61 31	
	s		″		s		″		s		″		s		″	
Jan. 1.1	53.788	1	62.38	174	55.534	26	69.89	240	17.445	20	31.32	41	36.92	15	41.54	288
11.1	53.789	37	60.64	178	55.508	— 15	67.49	253	17.465	53	31.73	36	36.77	8	38.66	313
21.0	53.826	70	58.86	176	55.523	56	64.96	255	17.518	86	32.09	25	36.69	— 1	35.53	323
31.0	53.896	104	57.10	164	55.579	98	62.41	247	17.604	117	32.34	15	36.70	8	32.30	321
Feb. 10.0	54.000	136	55.46	146	55.677	137	59.94	229	17.721	147	32.49	0	36.78	16	29.09	307
19.9	54.136	168	54.00	120	55.814	176	57.65	200	17.868	176	32.49	19	36.94	26	26.02	281
Mar. 1.9	54.304	198	52.80	88	55.990	214	55.65	162	18.044	203	32.30	38	37.20	31	23.21	241
11.9	54.502	224	51.92	51	56.204	247	54.03	118	18.247	226	31.92	59	37.51	37	20.80	194
21.9	54.726	249	51.41	10	56.451	276	52.85	68	18.473	251	31.33	81	37.88	43	18.86	139
31.8	54.975	270	51.31	— 31	56.727	301	52.17	16	18.724	270	30.52	101	38.31	48	17.47	78
Apr. 10.8	55.245	287	51.62	73	57.028	319	52.01	— 39	18.994	287	29.51	121	38.79	50	16.69	16
20.8	55.532	298	52.35	112	57.347	331	52.40	90	19.281	299	28.30	135	39.29	51	16.53	— 49
30.8	55.830	304	53.47	149	57.678	335	53.30	141	19.580	306	26.95	147	39.80	52	17.02	109
May 10.7	56.134	302	54.96	180	58.013	331	54.71	185	19.886	305	25.48	155	40.32	50	18.11	167
20.7	56.436	294	56.76	206	58.344	319	56.56	224	20.191	299	23.93	157	40.82	47	19.78	219
30.7	56.730	279	58.82	225	58.663	299	58.80	256	20.490	287	22.36	156	41.29	44	21.97	264
June 9.6	57.009	256	61.07	238	58.962	270	61.36	281	20.777	265	20.80	150	41.73	37	24.61	302
19.6	57.265	226	63.45	245	59.232	237	64.17	298	21.042	239	19.30	140	42.10	32	27.63	331
29.6	57.491	192	65.90	245	59.469	195	67.15	308	21.281	204	17.90	126	42.42	23	30.94	352
July 9.6	57.683	152	68.35	240	59.664	150	70.23	310	21.485	166	16.64	110	42.65	17	34.46	364
19.5	57.835	109	70.75	230	59.814	101	73.33	304	21.651	123	15.54	92	42.82	9	38.10	368
29.5	57.944	63	73.05	213	59.915	50	76.37	294	21.774	78	14.62	72	42.91	0	41.78	364
Aug. 8.5	58.007	17	75.18	196	59.965	— 1	79.31	276	21.852	32	13.90	55	42.91	7	45.42	351
18.5	58.024	— 26	77.14	171	59.964	48	82.07	253	21.884	— 12	13.35	36	42.84	16	48.93	333
28.4	57.998	67	78.85	148	59.916	93	84.60	226	21.872	55	12.99	18	42.68	22	52.26	306
Sept. 7.4	57.931	103	80.33	120	59.823	132	86.86	193	21.817	90	12.81	3	42.46	28	55.32	273
17.4	57.828	132	81.53	92	59.691	166	88.79	159	21.727	121	12.78	— 9	42.18	33	58.05	235
27.3	57.696	154	82.45	63	59.525	189	90.38	120	21.606	143	12.87	22	41.85	38	60.40	192
Oct. 7.3	57.542	169	83.08	32	59.336	205	91.58	79	21.463	157	13.09	29	41.47	41	62.32	143
17.3	57.373	172	83.40	4	59.131	213	92.37	38	21.306	162	13.38	36	41.06	43	63.75	90
27.3	57.201	170	83.44	— 28	58.918	210	92.75	— 7	21.144	157	13.74	41	40.63	43	64.65	37
Nov. 6.2	57.031	157	83.16	57	58.708	199	92.68	50	20.987	145	14.15	44	40.20	42	65.02	— 20
16.2	56.874	139	82.59	84	58.509	182	92.18	93	20.842	125	14.59	48	39.78	40	64.82	77
26.2	56.735	115	81.75	112	58.327	156	91.25	134	20.717	100	15.07	48	39.38	37	64.05	132
Dec. 6.2	56.620	88	80.63	134	58.171	126	89.91	173	20.617	70	15.55	50	39.01	32	62.73	185
16.1	56.532	55	79.29	155	58.045	92	88.18	205	20.547	37	16.05	48	38.69	26	60.88	232
26.1	56.477	22	77.74	171	57.953	53	86.13	230	20.510	5	16.53	46	38.43	20	58.56	271
36.1	56.455		76.03		57.900		83.83		20.505		16.99		38.23		55.85	
Mean Place	54.014		53.95		56.024		58.29		17.552		35.03		38.675		25.92	
Sec δ, Tan δ	1.040		+0.284		1.202		+0.667		1.015		−0.173		2.098		+1.844	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.06		−0.01		+0.05		−0.03		+0.06		+0.01		+0.02		−0.08	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		−0.8		+0.3		−0.8		+0.3		−0.8		+0.3		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Aquarii. Mag. 4.8-				β Indi. Mag. 3.7				32 Vulpeculæ. Mag. 5.2				220 H¹. Draconis. Mag. 5.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 48		− 9 16		20 48		−58 45		20 51		+27 44		20 51		+80 14	
	s		″		s		″		s		″		s		″	
Jan. 1.1	17.089	15	73.60	43	28.530	21	41.27	231	6.109	23	67.12	218	11.73	68	75.41	275
11.1	17.104	48	74.03	38	28.509	49	38.96	252	6.086	15	64.94	229	11.05	46	72.66	303
21.0	17.152	81	74.41	27	28.558	116	36.44	263	6.101	52	62.65	229	10.59	21	69.63	324
31.0	17.233	112	74.68	17	28.674	180	33.81	269	6.153	89	60.36	222	10.38	3	66.39	329
Feb. 10.0	17.345	142	74.85	1	28.854	242	31.12	270	6.242	128	58.14	203	10.41	29	63.10	323
20.0	17.487	170	74.86	17	29.096	298	28.42	265	6.370	163	56.11	177	10.70	50	59.87	302
Mar. 1.9	17.657	198	74.69	37	29.394	350	25.77	254	6.533	198	54.34	143	11.20	73	56.85	270
11.9	17.855	223	74.32	58	29.744	396	23.23	240	6.731	229	52.91	100	11.93	93	54.15	228
21.9	18.078	247	73.74	81	30.140	437	20.83	219	6.960	259	51.91	55	12.86	108	51.87	176
31.8	18.325	267	72.93	100	30.577	470	18.64	197	7.219	283	51.36	5	13.94	121	50.11	118
Apr. 10.8	18.592	284	71.93	121	31.047	500	16.67	169	7.502	302	51.31	45	15.15	128	48.93	57
20.8	18.876	297	70.72	136	31.547	517	14.98	137	7.804	315	51.76	93	16.43	131	48.36	7
30.8	19.173	306	69.36	149	32.064	527	13.61	103	8.119	321	52.69	139	17.74	131	48.43	67
May 10.7	19.479	305	67.87	157	32.591	527	12.58	66	8.440	320	54.08	180	19.05	125	49.10	125
20.7	19.784	300	66.30	161	33.118	514	11.92	27	8.760	310	55.88	216	20.30	115	50.35	185
30.7	20.084	288	64.69	159	33.632	490	11.65	11	9.070	294	58.04	244	21.45	104	52.20	230
June 9.7	20.372	268	63.10	154	34.122	454	11.76	49	9.364	269	60.48	267	22.49	90	54.50	276
19.6	20.640	241	61.56	144	34.576	407	12.25	87	9.633	239	63.15	280	23.39	70	57.26	310
29.6	20.881	209	60.12	131	34.983	349	13.12	122	9.872	199	65.95	289	24.09	53	60.36	333
July 9.6	21.090	170	58.81	114	35.332	280	14.34	152	10.071	158	68.84	289	24.62	31	63.69	354
19.5	21.260	127	57.67	96	35.612	206	15.86	177	10.229	112	71.73	283	24.93	11	67.23	366
29.5	21.387	83	56.71	77	35.818	125	17.63	196	10.341	63	74.56	271	25.04	10	70.89	367
Aug. 8.5	21.470	37	55.94	58	35.943	41	19.59	209	10.404	16	77.27	253	24.94	32	74.56	361
18.5	21.507	8	55.36	39	35.984	40	21.68	212	10.420	31	79.80	231	24.62	51	78.17	346
28.4	21.499	49	54.97	20	35.944	119	23.80	208	10.389	75	82.11	205	24.11	71	81.63	328
Sept. 7.4	21.450	87	54.77	6	35.825	192	25.88	196	10.314	113	84.16	174	23.40	87	84.91	298
17.4	21.363	118	54.71	8	35.633	252	27.84	173	10.201	144	85.90	143	22.53	101	87.89	265
27.4	21.245	140	54.79	21	35.381	300	29.57	147	10.057	170	87.33	107	21.52	115	90.54	226
Oct. 7.3	21.105	155	55.00	29	35.081	333	31.04	110	9.887	184	88.40	70	20.37	124	92.80	180
17.3	20.950	161	55.29	36	34.748	348	32.14	68	9.703	193	89.10	31	19.13	131	94.60	130
27.3	20.789	157	55.65	42	34.400	349	32.82	26	9.510	191	89.41	8	17.82	135	95.90	78
Nov. 6.2	20.632	145	56.07	45	34.051	331	33.08	21	9.319	182	89.33	47	16.47	134	96.68	19
16.2	20.487	126	56.52	49	33.720	299	32.87	66	9.137	165	88.86	86	15.13	131	96.87	41
26.2	20.361	102	57.01	51	33.421	253	32.21	109	8.972	143	88.00	123	13.82	124	96.46	99
Dec. 6.2	20.259	73	57.52	51	33.168	198	31.12	150	8.829	114	86.77	158	12.58	112	95.47	153
16.1	20.186	42	58.03	50	32.970	134	29.62	184	8.715	83	85.19	185	11.46	98	93.94	209
26.1	20.144	8	58.53	48	32.836	68	27.78	214	8.632	49	83.34	209	10.48	81	91.85	252
36.1	20.136		59.01		32.768		25.64		8.583		81.25		9.67		89.33	
Mean Place	17.181		77.40		29.396		38.12		6.450		56.14		18.445		57.55	
Sec δ, Tan δ	1.013		−0.164		1.928		−1.648		1.130		+0.526		5.907		+5.822	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		+0.01		+0.09		+0.07		+0.05		−0.02		−0.05		−0.26	
$D_\psi\delta$, $D_\omega\delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Cygni. Mag. 4.0				α Octantis. Mag. 5.2				γ Microscopii. Mag. 4.7				θ Capricorni. Mag. 4.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 54		+40 51		20 54		−77 19		20 56		−32 34		21 1		−17 32	
	s		″		s		″		s		″		s		″	
Jan. 1.1	8.561	58	30.21	255	53.84	21	68.94	306	19.449	6	31.03	89	23.684	4	77.99	3
11.1	8.503	12	27.66	271	53.63	2	65.88	326	19.455	45	30.14	105	23.688	39	77.96	14
21.0	8.491	33	24.95	278	53.61	13	62.62	339	19.500	85	29.09	119	23.727	72	77.82	27
31.0	8.524	80	22.17	274	53.74	30	59.23	342	19.585	121	27.90	130	23.799	103	77.55	38
Feb. 10.0	8.604	126	19.43	256	54.04	46	55.81	336	19.706	157	26.60	141	23.902	134	77.17	52
20.0	8.730	171	16.87	232	54.50	59	52.45	324	19.863	189	25.19	149	24.036	165	76.65	69
Mar. 1.9	8.901	214	14.55	194	55.09	74	49.21	305	20.052	222	23.70	156	24.201	193	75.96	83
11.9	9.115	253	12.61	150	55.83	84	46.16	280	20.274	252	22.14	161	24.394	221	75.13	99
21.9	9.368	288	11.11	98	56.67	95	43.36	247	20.526	278	20.53	164	24.615	247	74.14	116
31.9	9.656	317	10.13	43	57.62	103	40.89	212	20.804	303	18.89	162	24.862	269	72.98	128
Apr. 10.8	9.973	339	9.70	13	58.65	108	38.77	172	21.107	323	17.27	160	25.131	288	71.70	140
20.8	10.312	354	9.83	69	59.73	112	37.05	128	21.430	338	15.67	152	25.419	305	70.30	148
30.8	10.666	359	10.52	123	60.85	114	35.77	83	21.768	350	14.15	142	25.724	313	68.82	152
May 10.7	11.025	357	11.75	173	61.99	113	34.94	33	22.118	350	12.73	127	26.037	317	67.30	152
20.7	11.382	344	13.48	217	63.12	110	34.61	13	22.468	347	11.46	108	26.354	315	65.78	148
30.7	11.726	323	15.65	255	64.22	105	34.74	61	22.815	334	10.38	88	26.669	302	64.30	140
June 9.7	12.049	293	18.20	285	65.27	95	35.35	107	23.149	313	9.50	64	26.971	285	62.90	128
19.6	12.342	256	21.05	308	66.22	86	36.42	150	23.462	285	8.86	39	27.256	260	61.62	111
29.6	12.598	212	24.13	322	67.08	73	37.92	188	23.747	246	8.47	12	27.516	227	60.51	93
July 9.6	12.810	164	27.35	328	67.81	57	39.80	222	23.993	205	8.35	13	27.743	189	59.58	72
19.5	12.974	112	30.63	328	68.38	40	42.02	248	24.198	157	8.48	36	27.932	146	58.86	52
29.5	13.086	57	33.91	320	68.78	23	44.50	266	24.355	106	8.84	58	28.078	100	58.34	30
Aug. 8.5	13.143	3	37.11	303	69.01	5	47.16	275	24.461	52	9.42	79	28.178	53	58.04	11
18.5	13.146	51	40.14	285	69.06	15	49.91	274	24.513	2	10.21	90	28.231	6	57.93	8
28.4	13.095	99	42.99	256	68.91	33	52.65	263	24.511	51	11.11	100	28.237	39	58.01	23
Sept. 7.4	12.996	141	45.55	226	68.58	50	55.28	242	24.460	95	12.11	104	28.198	79	58.24	35
17.4	12.855	178	47.81	190	68.08	63	57.70	211	24.365	134	13.15	102	28.119	112	58.59	46
27.4	12.677	208	49.71	150	67.45	76	59.81	171	24.231	164	14.17	96	28.007	137	59.05	51
Oct. 7.3	12.469	226	51.21	107	66.69	85	61.52	124	24.067	183	15.13	84	27.870	155	59.56	52
17.3	12.243	237	52.28	61	65.84	90	62.76	71	23.884	192	15.97	66	27.715	163	60.08	53
27.3	12.006	238	52.89	14	64.94	92	63.47	14	23.692	191	16.63	49	27.552	162	60.61	49
Nov. 6.2	11.768	231	53.03	34	64.02	90	63.61	46	23.501	179	17.12	27	27.390	153	61.10	43
16.2	11.537	213	52.69	82	63.12	84	63.15	102	23.322	158	17.39	5	27.237	136	61.53	38
26.2	11.324	191	51.87	128	62.28	74	62.13	159	23.164	130	17.44	18	27.101	111	61.91	30
Dec. 6.2	11.133	160	50.59	172	61.54	62	60.54	208	23.034	98	17.26	38	26.990	82	62.21	20
16.1	10.973	125	48.87	211	60.92	46	58.46	251	22.936	60	16.88	59	26.908	53	62.41	14
26.1	10.848	86	46.76	240	60.46	32	55.95	285	22.876	21	16.29	78	26.855	18	62.55	4
36.1	10.762		44.36		60.14		53.10		22.855		15.51		26.837		62.59	
Mean Place	9.161		16.75		57.160		64.53		19.631		30.68		23.751		80.16	
Sec δ, Tan δ	1.322		+0.865		4.560		−4.449		1.187		−0.639		1.049		−0.316	
Dψα, Dωα	+0.04		−0.04		+0.15		+0.20		+0.07		+0.03		+0.07		+0.02	
Dψδ, Dωδ	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Cygni. Mag. 3.9				61 Cygni *pr.* Mag. 5.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 21 1		° ′ +43 36		h m 21 3		° ′ +38 20	
	s		″		s		″	
Jan. 1.1	58.409		29.65		15.343		74.68	
11.1	58.335	74	27.10	255	15.297	46	72.34	234
21.0	58.307	28 —	24.36	274	15.294	3 —	69.83	251
31.0	58.326	19	21.53	283	15.333	39	67.25	258
Feb. 10.0	58.395	69	18.72	281	15.418	85	64.72	253
20.0	58.512	117	16.06	266	15.546	128	62.33	239
Mar. 1.9	58.677	165	13.63	243	15.717	171	60.21	212
11.9	58.887	210	11.57	206	15.930	213	58.44	177
21.9	59.141	254	9.94	163	16.181	251	57.11	133
31.9	59.432	291	8.81	113	16.466	285	56.27	84
Apr. 10.8	59.754	322	8.23	58 —	16.781	315	55.96	31 —
20.8	60.102	348	8.24	1	17.118	337	56.20	24
30.8	60.466	364	8.81	57	17.472	354	56.99	79
May 10.7	60.837	371	9.93	112	17.832	360	58.31	132
20.7	61.207	370	11.57	164	18.191	359	60.11	180
30.7	61.565	358	13.68	211	18.539	348	62.35	224
June 9.7	61.903	338	16.19	251	18.869	330	64.95	260
19.6	62.210	307	19.02	283	19.171	302	67.84	289
29.6	62.480	270	22.11	309	19.438	267	70.96	312
July 9.6	62.705	225	25.35	324	19.664	226	74.20	324
19.6	62.880	175	28.69	334	19.843	179	77.51	331
29.5	63.002	122	32.05	336	19.971	128	80.81	330
Aug. 8.5	63.068	66	35.34	329	20.047	76	84.02	321
18.5	63.077	9 —	38.50	316	20.071	24 —	87.08	306
28.4	63.031	46	41.45	295	20.043	28	89.94	286
Sept. 7.4	62.934	97	44.17	272	19.968	75	92.53	259
17.4	62.793	141	46.57	240	19.850	118	94.83	230
27.4	62.612	181	48.61	204	19.696	154	96.76	193
Oct. 7.3	62.399	213	50.26	165	19.514	182	98.31	155
17.3	62.166	233	51.47	121	19.312	202	99.44	113
27.3	61.919	247	52.22	75	19.098	214	100.14	70
Nov. 6.3	61.669	250	52.49	27 —	18.884	214	100.38	24 —
16.2	61.425	244	52.27	22	18.677	207	100.15	23
26.2	61.195	230	51.55	72	18.483	194	99.46	69
Dec. 6.2	60.989	206	50.35	120	18.313	170	98.32	114
16.1	60.812	177	48.69	166	18.170	143	96.77	155
26.1	60.668	144	46.62	207	18.060	110	94.86	191
36.1	60.565	103	44.23	239	17.988	72	92.63	223
Mean Place	59.037		15.27		15.836		61.37	
Sec δ, Tan δ	1.381		+0.953		1.275		+0.791	
$D_\psi\alpha$, $D_\omega\alpha$	+0.04		−0.05		+0.05		−0.04	
$D_\psi\delta$, $D_\omega\delta$	+0.3		−0.7		+0.3		−0.7	

Washington Mean Time.	ν Aquarii. Mag. 4.5				Bradley 2777. Mag. 5.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 21 5		° ′ −11 41		h m 21 7		° ′ +77 47	
	s		″		s		″	
Jan. 1.1	10.944		57.77		4.14		72.39	
11.1	10.944	0	58.06	29	3.58	56	69.75	264
21.0	10.977	33	58.25	19	3.17	41	66.78	297
31.0	11.042	65	58.36	11 —	2.94	23	63.59	319
Feb. 10.0	11.137	95	58.33	3	2.92	2 —	60.30	329
20.0	11.264	127	58.15	18	3.09	17	57.05	325
Mar. 1.9	11.420	156	57.80	35	3.45	36	53.96	309
11.9	11.604	184	57.26	54	3.99	54	51.16	280
21.9	11.816	212	56.51	75	4.69	70	48.76	240
31.9	12.054	238	55.57	94	5.54	85	46.86	190
Apr. 10.8	12.315	261	54.43	114	6.48	94	45.52	134
20.8	12.595	280	53.13	130	7.50	102	44.77	75
30.8	12.891	296	51.69	144	8.56	106	44.66	11 —
May 10.7	13.198	307	50.14	155	9.63	107	45.18	52
20.7	13.508	310	48.54	160	10.67	104	46.30	112
30.7	13.815	307	46.92	162	11.66	99	47.98	168
June 9.7	14.113	298	45.34	158	12.56	90	50.18	220
19.6	14.392	279	43.83	151	13.34	78	52.82	264
29.6	14.647	255	42.43	140	14.00	66	55.84	302
July 9.6	14.870	223	41.20	123	14.51	51	59.14	330
19.6	15.057	187	40.13	107	14.85	34	62.67	353
29.5	15.202	145	39.27	86	15.03	18	66.32	365
Aug. 8.5	15.302	100	38.61	66	15.05	2 —	70.03	371
18.5	15.355	53	38.15	46	14.88	17	73.71	368
28.4	15.364	9 —	37.89	26	14.56	32	77.27	356
Sept. 7.4	15.329	35	37.80	9 —	14.09	47	80.67	340
17.4	15.255	74	37.87	7	13.46	63	83.80	313
27.4	15.149	106	38.08	21	12.72	74	86.63	283
Oct. 7.3	15.018	131	38.38	30	11.87	85	89.06	243
17.3	14.870	148	38.76	38	10.93	94	91.05	199
27.3	14.713	157	39.20	44	9.93	100	92.56	151
Nov. 6.3	14.557	156	39.66	46	8.89	104	93.52	96
16.2	14.409	148	40.14	48	7.85	104	93.90	38 —
26.2	14.278	131	40.61	47	6.81	104	93.70	20
Dec. 6.2	14.169	109	41.07	46	5.83	98	92.91	79
16.1	14.086	83	41.50	43	4.92	91	91.52	139
26.1	14.032	54	41.90	40	4.12	80	89.60	192
36.1	14.010	22	42.25	35	3.45	67	87.22.	238
Mean Place	10.986		61.06		8.907		53.39	
Sec δ, Tan δ	1.021		−0.207		4.733		+4.627	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		+0.01		−0.02		−0.22	
$D_\psi\delta$, $D_\omega\delta$	+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**3 Piscis Australis.** Mag. 5.6				ζ **Cygni.** Mag. 3.4				τ **Cygni.** Mag. 3.8				α **Equulei.** Mag. 4.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 8		−27 56		21 9		+29 53		21 11		+37 41		21 11		+ 4 54	
	s		″		s		″		s		″		s		″	
Jan. 1.1	29.228		61.58		28.999		50.62		33.011		70.56		46.462		51.09	
		4		61		44		215		62		233		13		113
11.1	29.224	—	60.97		28.955		48.47		32.949		68.23		46.449	—	49.96	
		32		78		7		228		25		251		18		113
21.1	29.256		60.19		28.948	—	46.19		32.924	—	65.72		46.467		48.83	
		68		90		30		233		18		261		49		109
31.0	29.324		59.29		28.978		43.86		32.942		63.11		46.516		47.74	
		103		105		69		229		62		258		81		98
Feb. 10.0	29.427		58.24		29.047		41.57		33.004		60.53		46.597		46.76	
		136		118		107		213		104		244		111		82
20.0	29.563		57.06		29.154		39.44		33.108		58.09		46.708		45.94	
		169		129		145		190		148		220		141		60
Mar. 1.9	29.732		55.77		29.299		37.54		33.256		55.89		46.849		45.34	
		201		139		182		156		189		189		172		34
11.9	29.933		54.38		29.481		35.98		33.445		54.00		47.021		45.00	
		229		149		218		117		229		146		200		4
21.9	30.162		52.89		29.699		34.81		33.674		52.54		47.221		44.96	—
		258		155		250		71		266		99		226		28
31.9	30.420		51.34		29.949		34.10		33.940		51.55		47.447		45.24	
		283		160		276		22		296		46		252		61
Apr. 10.8	30.703		49.74		30.225		33.88	—	34.236		51.09	—	47.699		45.85	
		305		162		301		28		320		8		271		91
20.8	31.008		48.12		30.526		34.16		34.556		51.17		47.970		46.76	
		321		160		317		78		339		61		288		123
30.8	31.329		46.52		30.843		34.94		34.895		51.78		48.258		47.99	
		334		154		326		125		348		114		299		149
May 10.8	31.663		44.98		31.169		36.19		35.243		52.92		48.557		49.48	
		338		144		329		169		350		163		303		172
20.7	32.001		43.54		31.498		37.88		35.593		54.55		48.860		51.20	
		337		129		322		206		342		206		300		189
30.7	32.338		42.25		31.820		39.94		35.935		56.61		49.160		53.09	
		326		111		307		238		327		244		291		200
June 9.7	32.664		41.14		32.127		42.32		36.262		59.05		49.451		55.09	
		307		92		285		264		300		273		273		207
19.6	32.971		40.22		32.412		44.96		36.562		61.78		49.724		57.16	
		283		67		255		281		268		298		247		207
29.6	33.254		39.55		32.667		47.77		36.830		64.76		49.971		59.23	
		248		44		218		292		229		310		218		202
July 9.6	33.502		39.11		32.885		50.69		37.059		67.86		50.189		61.25	
		209		18		178		295		183		320		181		194
19.6	33.711		38.93	—	33.063		53.64		37.242		71.06		50.370		63.19	
		163		6		131		293		135		320		140		179
29.5	33.874		38.99		33.194		56.57		37.377		74.26		50.510		64.98	
		114		30		83		283		81		313		98		162
Aug. 8.5	33.988		39.29		33.277		59.40		37.458		77.39		50.608		66.60	
		64		50		34		267		30		299		53		144
18.5	34.052		39.79		33.311	—	62.07		37.488	—	80.38		50.661		68.04	
		13		67		14		247		21		281		9		121
28.4	34.065	—	40.46		33.297		64.54		37.467		83.19		50.670	—	69.25	
		36		79		58		222		70		256		33		100
Sept. 7.4	34.029		41.25		33.239		66.76		37.397		85.75		50.637		70.25	
		79		87		98		193		113		227		70		77
17.4	33.950		42.12		33.141		68.69		37.284		88.02		50.567		71.02	
		117		91		133		161		150		192		102		55
27.4	33.833		43.03		33.008		70.30		37.134		89.94		50.465		71.57	
		146		88		161		126		179		156		128		31
Oct. 7.3	33.687		43.91		32.847		71.56		36.955		91.50		50.337		71.88	
		168		80		179		90		201		115		143		12
17.3	33.519		44.71		32.668		72.46		36.754		92.65		50.194		72.00	—
		177		70		190		49		215		72		153		10
27.3	33.342		45.41		32.478		72.95		36.539		93.37		50.041		71.90	
		178		57		192		10		217		27		154		30
Nov. 6.3	33.164		45.98		32.286		73.05	—	36.322		93.64	—	49.887		71.60	
		168		41		187		32		213		19		146		47
16.2	32.996		46.39		32.099		72.73		36.109		93.45		49.741		71.13	
		152		21		174		71		201		65		134		66
26.2	32.844		46.60		31.925		72.02		35.908		92.80		49.607		70.47	
		127		4		153		111		182		109		113		81
Dec. 6.2	32.717		46.64	—	31.772		70.91		35.726		91.71		49.494		69.66	
		99		15		129		146		155		151		91		94
16.1	32.618		46.49		31.643		69.45		35.571		90.20		49.403		68.72	
		64		32		102		178		125		189		63		105
26.1	32.554		46.17		31.541		67.67		35.446		88.31		49.340		67.67	
		30		50		67		205		91		221		34		114
36.1	32.524		45.67		31.474		65.62		35.355		86.10		49.306		66.53	
Mean Place	29.333		61.69		29.280		38.40		33.424		56.72		46.504		44.19	
Sec δ, Tan δ	1.132		−0.530		1.154		+0.575		1.264		+0.773		1.004		+0.086	
$D_\psi \alpha$, $D_\omega \alpha$	+0.07		+0.03		+0.05		−0.03		+0.05		−0.04		+0.06		0.00	
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	*σ* Cygni. Mag. 4.3				*θ*¹ Microscopii. Mag. 4.9				*α* Cephei. Mag. 2.6				*ι* Capricorni. Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 14		+39 3		21 15		−41 8		21 16		+62 14		21 17		−17 10	
	s		″		s		″		s		″		s		″	
Jan. 1.1	13.583	70	31.43	236	34.731	23	72.13	132	37.44	21	49.51	263	44.325	11	46.81	2
11.1	13.513	30	29.07	257	34.708	19	70.81	154	37.23	13	46.88	295	44.314	22	46.79	13
21.1	13.483	12	26.50	265	34.727	62	69.27	171	37.10	7	43.93	314	44.336	54	46.66	26
31.0	13.495	56	23.85	263	34.789	103	67.56	185	37.03	2	40.79	320	44.390	86	46.40	40
Feb. 10.0	13.551	101	21.22	251	34.892	145	65.71	195	37.05	10	37.59	315	44.476	117	46.00	54
20.0	13.652	146	18.71	229	35.037	182	63.76	203	37.15	19	34.44	295	44.593	147	45.46	71
Mar. 1.9	13.798	188	16.42	195	35.219	221	61.73	207	37.34	26	31.49	265	44.740	177	44.75	87
11.9	13.986	229	14.47	154	35.440	256	59.66	207	37.60	34	28.84	224	44.917	207	43.88	104
21.9	14.215	267	12.93	107	35.696	288	57.59	205	37.94	40	26.60	174	45.124	233	42.84	121
31.9	14.482	299	11.86	54	35.984	318	55.54	197	38.34	45	24.86	118	45.357	259	41.63	135
Apr. 10.8	14.781	323	11.32	2	36.302	343	53.57	187	38.79	50	23.68	58	45.616	280	40.28	147
20.8	15.104	343	11.34	55	36.645	363	51.70	173	39.29	52	23.10	6	45.896	299	38.81	155
30.8	15.447	354	11.89	109	37.008	378	49.97	153	39.81	53	23.16	67	46.195	310	37.26	160
May 10.8	15.801	355	12.98	158	37.386	385	48.44	131	40.34	53	23.83	126	46.505	317	35.66	161
20.7	16.156	346	14.56	203	37.771	383	47.13	105	40.87	51	25.09	181	46.822	317	34.05	158
30.7	16.502	332	16.59	241	38.154	373	46.08	76	41.38	48	26.90	231	47.139	307	32.47	149
June 9.7	16.834	305	19.00	272	38.527	353	45.32	46	41.86	43	29.21	274	47.446	293	30.98	137
19.6	17.139	273	21.72	298	38.880	326	44.86	14	42.29	38	31.95	308	47.739	268	29.61	121
29.6	17.412	233	24.70	312	39.206	286	44.72	18	42.67	31	35.03	336	48.007	240	28.40	102
July 9.6	17.645	187	27.82	321	39.492	242	44.90	48	42.98	23	38.39	355	48.247	202	27.38	81
19.6	17.832	136	31.03	324	39.734	194	45.38	77	43.21	15	41.94	365	48.449	160	26.57	59
29.5	17.968	85	34.27	317	39.928	134	46.15	101	43.36	8	45.59	368	48.609	115	25.98	37
Aug. 8.5	18.053	31	37.44	303	40.062	77	47.16	123	43.44	0	49.27	362	48.724	69	25.61	14
18.5	18.084	20	40.47	286	40.139	18	48.39	137	43.44	8	52.89	349	48.793	21	25.47	4
28.5	18.064	70	43.33	261	40.157	39	49.76	146	43.36	16	56.38	328	48.814	24	25.51	23
Sept. 7.4	17.994	114	45.94	233	40.118	91	51.22	148	43.20	24	59.66	301	48.790	64	25.74	35
17.4	17.880	152	48.27	198	40.027	136	52.70	144	42.96	29	62.67	268	48.726	99	26.09	47
27.4	17.728	182	50.25	160	39.891	174	54.14	132	42.67	33	65.35	228	48.627	127	26.56	54
Oct. 7.3	17.546	205	51.85	120	39.717	199	55.46	113	42.34	38	67.63	184	48.500	147	27.10	57
17.3	17.341	218	53.05	77	39.518	215	56.59	92	41.96	41	69.47	134	48.353	157	27.67	57
27.3	17.123	222	53.82	31	39.303	218	57.51	63	41.55	42	70.81	81	48.196	159	28.24	55
Nov. 6.3	16.901	219	54.13	16	39.085	210	58.14	33	41.13	43	71.62	25	48.037	153	28.79	50
16.2	16.682	207	53.97	62	38.875	193	58.47	2	40.70	41	71.87	33	47.884	138	29.29	43
26.2	16.475	189	53.35	108	38.682	167	58.49	30	40.29	39	71.54	90	47.746	117	29.72	35
Dec. 6.2	16.286	162	52.27	151	38.515	133	58.19	62	39.90	36	70.64	146	47.629	93	30.07	26
16.2	16.124	132	50.76	189	38.382	95	57.57	89	39.54	31	69.18	197	47.536	63	30.33	17
26.1	15.992	95	48.87	222	38.287	54	56.68	115	39.23	25	67.21	242	47.473	32	30.50	9
36.1	15.897		46.65		38.233		55.53		38.98		64.79		47.441		30.59	
Mean Place	14.011		17.18		34.975		69.83		38.892		31.36		44.339		48.86	
Sec *δ*, Tan *δ*	1.288		+0.812		1.328		−0.874		2.148		+1.900		1.047		−0.309	
$D_\psi\alpha$, $D_\omega\alpha$	+0.05		−0.04		+0.08		+0.04		+0.03		−0.10		+0.07		+0.02	
$D_\psi\delta$, $D_\omega\delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	1 Pegasi. Mag. 4.2				γ Pavonis. Mag. 4.3				ζ Capricorni. Mag. 3.9				*g* Cygni. Mag. 5.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 18		+19 27		21 19		−65 43		21 22		−22 45		21 26		+46 10	
	s		″		s		″		s		″		s		″	
Jan. 1.1	20.304		36.65		44.64		67.36		2.726		45.61		27.041		74.98	
11.1	20.271	33	34.92	173	44.52	12	64.83	253	2.710	16 —	45.29	32	26.932	109	72.59	239
21.1	20.269	2 —	33.10	182	44.49	3 —	62.05	278	2.728	18	44.83	46	26.868	64	69.93	266
31.0	20.302	33	31.27	183	44.54	5	59.06	299	2.778	50	44.23	60	26.851	17 —	67.12	281
Feb. 10.0	20.368	66	29.50	177	44.66	12	55.96	310	2.862	84	43.47	76	26.884	33	64.29	283
20.0	20.467	99	27.89	161	44.87	21	52.82	314	2.978	116	42.57	90	26.968	84	61.53	276
Mar. 1.9	20.601	134	26.49	140	45.15	28	49.69	313	3.125	147	41.52	105	27.105	137	58.98	255
11.9	20.768	167	25.41	108	45.51	36	46.67	302	3.304	179	40.32	120	27.293	188	56.73	225
21.9	20.968	200	24.67	74	45.94	43	43.78	289	3.513	209	39.00	132	27.528	235	54.87	186
31.9	21.197	229	24.34	33 —	46.42	48	41.11	267	3.750	237	37.56	144	27.807	279	53.49	138
Apr. 10.8	21.454	257	24.43	9	46.95	53	38.69	242	4.014	264	36.02	154	28.124	317	52.64	85
20.8	21.733	279	24.95	52	47.53	58	36.57	212	4.301	287	34.40	162	28.473	349	52.36	28 —
30.8	22.029	296	25.89	94	48.14	61	34.81	176	4.608	307	32.75	165	28.845	372	52.64	28
May 10.8	22.338	309	27.23	134	48.77	63	33.43	138	4.927	319	31.12	163	29.230	385	53.50	86
20.7	22.651	313	28.93	170	49.41	64	32.47	96	5.253	326	29.53	159	29.618	388	54.90	140
30.7	22.961	310	30.93	200	50.04	63	31.94	53	5.580	327	28.04	149	30.001	383	56.78	188
June 9.7	23.259	298	33.17	224	50.66	62	31.87	7 —	5.899	319	26.67	137	30.366	365	59.10	232
19.6	23.540	281	35.59	242	51.24	58	32.24	37	6.202	303	25.49	118	30.704	338	61.80	270
29.6	23.793	253	38.12	253	51.77	53	33.05	81	6.483	281	24.49	100	31.007	303	64.79	299
July 9.6	24.015	222	40.72	260	52.24	47	34.27	122	6.732	249	23.73	76	31.267	260	68.00	321
19.6	24.200	185	43.29	257	52.62	38	35.85	158	6.944	212	23.20	53	31.477	210	71.34	334
29.5	24.342	142	45.80	251	52.92	30	37.75	190	7.114	170	22.92	28	31.633	156	74.74	340
Aug. 8.5	24.439	97	48.19	239	53.13	21	39.91	216	7.237	123	22.87	5 —	31.732	99	78.13	339
18.5	24.491	52	50.41	222	53.24	11	42.24	233	7.312	75	23.05	18	31.772	40 —	81.43	330
28.5	24.497	6 —	52.41	200	53.24	0	44.66	242	7.338	26 —	23.41	36	31.756	16	84.58	315
Sept. 7.4	24.460	37	54.19	178	53.14	10	47.08	242	7.317	21	23.94	53	31.686	70	87.50	292
17.4	24.385	75	55.70	151	52.94	20	49.41	233	7.254	63	24.59	65	31.566	120	90.14	264
27.4	24.276	109	56.91	121	52.66	28	51.53	212	7.154	100	25.32	73	31.403	163	92.47	233
Oct. 7.3	24.142	134	57.84	93	52.32	34	53.38	185	7.024	130	26.08	76	31.204	199	94.41	194
17.3	23.989	153	58.45	61	51.91	41	54.86	148	6.874	150	26.82	74	30.979	225	95.94	153
27.3	23.824	165	58.73	28 —	51.47	44	55.90	104	6.710	164	27.51	69	30.735	244	97.01	107
Nov. 6.3	23.658	166	58.71	2	51.02	45	56.46	56	6.545	165	28.13	62	30.481	254	97.60	59
16.2	23.497	161	58.35	36	50.57	45	56.51	5 —	6.386	159	28.63	50	30.228	253	97.69	9 —
26.2	23.347	150	57.68	67	50.14	43	56.02	49	6.240	146	29.01	38	29.983	245	97.27	42
Dec. 6.2	23.214	133	56.72	96	49.76	38	55.03	99	6.115	125	29.24	23	29.754	229	96.35	92
16.2	23.104	110	55.48	124	49.44	32	53.55	148	6.014	101	29.33	9 —	29.551	203	94.94	141
26.1	23.019	85	54.01	147	49.18	26	51.63	192	5.944	70	29.27	6	29.378	173	93.09	185
36.1	22.965	54	52.34	167	49.01	17	49.34	229	5.904	40	29.06	21	29.240	138	90.86	223
Mean Place	20.412		26.34		45.864		62.02		2.752		46.43		27.567		58.76	
Sec δ, Tan δ	1.061		+0.353		2.433		−2.218		1.084		−0.420		1.444		+1.042	
$D_\psi \alpha$, $D_\omega \alpha$	+0.05		−0.02		+0.10		+0.11		+0.07		+0.02		+0.04		−0.05	
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.6		+0.3		−0.6		+0.3		−0.6		+0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Aquarii. Mag. 3.1				β Cephei. Mag. 3.3				ξ Aquarii. Mag. 4.8				74 Cygni. Mag. 5.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 27		– 5 55		21 27		+70 12		21 33		– 8 12		21 33		+40 2	
	s		″		s		″		s		″		s		″	
Jan. 1.1	17.800	20	37.11	56	35.08	34	37.62	252	26.541	23	61.21	45	41.782	93	72.13	225
11.1	17.780	11	37.67	52	34.74	27	35.10	286	26.518	4	61.66	38	41.689	53	69.88	247
21.1	17.791	39	38.19	41	34.47	15	32.24	313	26.522	35	62.04	26	41.636	13	67.41	261
31.0	17.830	70	38.60	29	34.32	4	29.11	325	26.557	66	62.30	14	41.623	32	64.80	263
Feb. 10.0	17.900	99	38.89	14	34.28	8	25.86	324	26.623	95	62.44	2	41.655	77	62.17	254
20.0	17.999	131	39.03	6	34.36	20	22.62	310	26.718	125	62.42	21	41.732	122	59.63	235
Mar. 2.0	18.130	161	38.97	28	34.56	31	19.52	285	26.843	156	62.21	41	41.854	169	57.28	206
11.9	18.291	189	38.69	51	34.87	41	16.67	247	26.999	185	61.80	64	42.023	212	55.22	167
21.9	18.480	218	38.18	76	35.28	52	14.20	200	27.184	215	61.16	87	42.235	253	53.55	122
31.9	18.698	243	37.42	99	35.80	58	12.20	147	27.399	241	60.29	109	42.488	288	52.33	71
Apr. 10.8	18.941	267	36.43	123	36.38	64	10.73	85	27.640	264	59.20	129	42.776	319	51.62	18
20.8	19.208	285	35.20	142	37.02	68	9.88	25	27.904	284	57.91	147	43.095	341	51.44	37
30.8	19.493	298	33.78	159	37.70	70	9.63	38	28.188	298	56.44	163	43.436	357	51.81	91
May 10.8	19.791	307	32.19	171	38.40	70	10.01	100	28.486	308	54.81	171	43.798	362	52.72	142
20.7	20.098	306	30.48	177	39.10	68	11.01	157	28.794	309	53.10	177	44.155	359	54.14	186
30.7	20.404	299	28.71	180	39.78	63	12.58	209	29.103	302	51.33	176	44.514	345	56.00	228
June 9.7	20.703	285	26.91	177	40.41	57	14.67	256	29.405	290	49.57	173	44.859	324	58.28	262
19.7	20.988	263	25.14	170	40.98	49	17.23	295	29.695	268	47.84	162	45.183	292	60.90	289
29.6	21.251	235	23.44	158	41.47	42	20.18	326	29.963	241	46.22	150	45.475	254	63.79	308
July 9.6	21.486	200	21.86	143	41.89	31	23.44	351	30.204	207	44.72	133	45.729	211	66.87	320
19.6	21.686	160	20.43	124	42.20	21	26.95	365	30.411	167	43.39	113	45.940	161	70.07	324
29.5	21.846	117	19.19	104	42.41	10	30.60	373	30.578	124	42.26	93	46.101	109	73.31	321
Aug. 8.5	21.963	72	18.15	84	42.51	1	34.33	372	30.702	80	41.33	70	46.210	57	76.52	312
18.5	22.035	28	17.31	62	42.50	11	38.05	363	30.782	34	40.63	50	46.267	3	79.64	295
28.5	22.063	15	16.69	42	42.39	21	41.68	346	30.816	9	40.13	28	46.270	46	82.59	274
Sept. 7.4	22.048	55	16.27	22	42.18	30	45.14	324	30.807	47	39.85	10	46.224	93	85.33	247
17.4	21.993	87	16.05	5	41.88	41	48.38	293	30.760	84	39.75	6	46.131	134	87.80	215
27.4	21.906	116	16.00	11	41.47	46	51.31	255	30.676	112	39.81	22	45.997	167	89.95	179
Oct. 7.4	21.790	134	16.11	25	41.01	52	53.86	213	30.564	131	40.03	33	45.830	191	91.74	140
17.3	21.656	146	16.36	34	40.49	57	55.99	165	30.433	144	40.36	41	45.639	210	93.14	98
27.3	21.510	149	16.70	45	39.92	59	57.64	113	30.289	148	40.77	48	45.429	218	94.12	52
Nov. 6.3	21.361	144	17.15	51	39.33	61	58.77	55	30.141	144	41.25	53	45.211	218	94.64	5
16.2	21.217	133	17.66	56	38.72	61	59.32	5	29.997	134	41.78	56	44.993	210	94.69	41
26.2	21.084	114	18.22	60	38.11	58	59.27	62	29.863	117	42.34	56	44.783	197	94.28	89
Dec. 6.2	20.970	95	18.82	63	37.53	54	58.65	122	29.746	96	42.90	57	44.586	177	93.39	133
16.2	20.875	68	19.45	63	36.99	49	57.43	177	29.650	71	43.47	54	44.409	148	92.06	174
26.1	20.807	41	20.08	62	36.50	40	55.66	227	29.579	45	44.01	51	44.261	117	90.32	209
36.1	20.766		20.70		36.10		53.39		29.534		44.52		44.144		88.23	
Mean Place	17.762		41.62		37.302		17.78		26.480		65.17		42.098		56.72	
Sec δ, Tan δ	1.005		–0.104		2.954		+2.779		1.010		–0.144		1.306		+0.841	
$D_\psi a$, $D_\omega a$	+0.06		+0.01		+0.02		–0.15		+0.06		+0.01		+0.05		–0.04	
$D_\psi \delta$, $D_\omega \delta$	+0.3		–0.6		+0.3		–0.6		+0.3		–0.6		+0.3		–0.	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Capricorni. Mag. 3.8				ε Pegasi. Mag. 2.5				11 Cephei. Mag. 4.8				δ Capricorni. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 35		−17 1		21 40		+ 9 30		21 40		+70 56		21 42		−16 29	
	s		″		s		″		s		″		s		″	
Jan. 1.1	36.380		41.67		12.506		19.26		42.31		38.36		34.401		41.88	
		25		0		40		126		40		236		31		4
11.1	36.355	—	41.67		12.466		18.00		41.91		36.00		34.370		41.92	—
		4		13		10		128		31		275		2		8
21.1	36.359		41.54		12.456	—	16.72		41.60		33.25		34.368	—	41.84	
		36		27		20		127		19		305		28		24
31.0	36.395		41.27		12.476		15.45		41.41		30.20		34.396		41.60	
		67		41		48		118		7		320		59		38
Feb. 10.0	36.462		40.86		12.524		14.27		41.34	—	27.00		34.455		41.22	
		97		57		81		104		4		323		89		54
20.0	36.559		40.29		12.605		13.23		41.38		23.77		34.544		40.68	
		129		75		113		84		16		313		121		73
Mar. 2.0	36.688		39.54		12.718		12.39		41.54		20.64		34.665		39.95	
		160		92		144		58		29		292		153		89
11.9	36.848		38.62		12.862		11.81		41.83		17.72		34.818		39.06	
		189		110		177		27		39		256		182		109
21.9	37.037		37.52		13.039		11.54	—	42.22		15.16		35.000		37.97	
		220		126		208		4		50		214		214		126
31.9	37.257		36.26		13.247		11.58		42.72		13.02		35.214		36.71	
		247		141		235		42		58		161		241		141
Apr. 10.9	37.504		34.85		13.482		12.00		43.30		11.41		35.455		35.30	
		270		153		261		76		65		102		267		155
20.8	37.774		33.32		13.743		12.76		43.95		10.39		35.722		33.75	
		291		164		280		110		69		43		288		165
30.8	38.065		31.68		14.023		13.86		44.64		9.96	—	36.010		32.10	
		308		169		297		140		72		20		306		171
May 10.8	38.373		29.99		14.320		15.26		45.36		10.16		36.316		30.39	
		315		169		306		168		73		81		315		173
20.7	38.688		28.30		14.626		16.94		46.09		10.97		36.631		28.66	
		319		166		306		191		71		140		319		169
30.7	39.007		26.64		14.932		18.85		46.80		12.37		36.950		26.97	
		314		158		300		207		67		194		315		161
June 9.7	39.321		25.06		15.232		20.92		47.47		14.31		37.265		25.36	
		299		146		288		218		62		242		301		151
19.7	39.620		23.60		15.520		23.10		48.09		16.73		37.566		23.85	
		280		130		265		223		54		283		284		134
29.6	39.900		22.30		15.785		25.33		48.63		19.56		37.850		22.51	
		251		110		238		223		46		316		255		114
July 9.6	40.151		21.20		16.023		27.56		49.09		22.72		38.105		21.37	
		217		89		203		218		35		345		220		93
19.6	40.368		20.31		16.226		29.74		49.44		26.17		38.325		20.44	
		176		65		165		205		25		361		182		69
29.6	40.544		19.66		16.391		31.79		49.69		29.78		38.507		19.75	
		132		42		122		192		15		373		139		47
Aug. 8.5	40.676		19.24		16.513		33.71		49.84		33.51		38.646		19.28	
		87		18		78		174		4		374		93		21
18.5	40.763		19.06	—	16.591		35.45		49.88	—	37.25		38.739		19.07	
		38		2		34		152		8		368		46		1
28.5	40.801	—	19.08		16.625	—	36.97		49.80		40.93		38.785		19.06	—
		6		22		8		131		19		354		0		20
Sept. 7.4	40.795		19.30		16.617		38.28		49.61		44.47		38.785		19.26	
		47		37		46		106		28		334		41		35
17.4	40.748		19.67		16.571		39.34		49.33		47.81		38.744		19.61	
		84		50		82		81		37		306		78		49
27.4	40.664		20.17		16.489		40.15		48.96		50.87		38.666		20.10	
		115		58		109		57		44		270		109		59
Oct. 7.4	40.549		20.75		16.380		40.72		48.52		53.57		38.557		20.69	
		136		63		129		32		52		231		131		64
17.3	40.413		21.38		16.251		41.04		48.00		55.88		38.426		21.33	
		149		63		143		9		58		183		145		65
27.3	40.264		22.01		16.108		41.13	—	47.42		57.71		38.281		21.98	
		154		62		148		15		60		132		152		64
Nov. 6.3	40.110		22.63		15.960		40.98		46.82		59.03		38.129		22.62	
		152		57		147		36		62		76		149		60
16.3	39.958		23.20		15.813		40.62		46.20		59.79		37.980		23.22	
		140		49		138		58		62		17		141		54
26.2	39.818		23.69		15.675		40.04		45.58		59.96	—	37.839		23.76	
		123		42		124		79		60		43		123		45
Dec. 6.2	39.695		24.11		15.551		39.25		44.98		59.53		37.716		24.21	
		101		31		106		96		58		102		104		36
16.2	39.594		24.42		15.445		38.29		44.40		58.51		37.612		24.57	
		75		21		83		112		52		159		79		25
26.1	39.519		24.63		15.362		37.17		43.88		56.92		37.533		24.82	
		47		9		58		122		46		211		53		14
36.1	39.472		24.72		15.304		35.95		43.42		54.81		37.480		24.96	
Mean Place	36.330		43.54		12.445		10.84		44.390		17.60		34.325		43.77	
Sec δ, Tan δ	1.046		−0.306		1.014		+0.167		3.063		+2.895		1.043		−0.296	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.07		+0.02		+0.06		−0.01		+0.02		−0.16		+0.06		+0.02	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		−0.6		+0.3		−0.6		+0.3		−0.6		+0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π^2 Cygni. Mag. 4.3				μ Capricorni. Mag. 5.2				γ Gruis. Mag. 3.2				16 Pegasi. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 43		+48 55		21 48		–13 55		21 49		–37 44		21 49		+25 32	
	s		″		s		″		s		″		s		″	
Jan. 1.1	47.502	139	81.31	230	52.996	36	59.27	17	1.620	57	50.41	103	22.540	68	49.68	178
11.1	47.363	96	79.01	261	52.960	8 —	59.44	4 —	1.563	20 —	49.38	128	22.472	37	47.90	193
21.1	47.267	46 —	76.40	279	52.952	22	59.48	8	1.543	18	48.10	149	22.435	6 —	45.97	201
31.0	47.221	4	73.61	287	52.974	52	59.40	25	1.561	56	46.61	169	22.429	29	43.96	199
Feb. 10.0	47.225	59	70.74	284	53.026	81	59.15	40	1.617	93	44.92	185	22.458	65	41.97	190
20.0	47.284	115	67.90	267	53.107	114	58.75	58	1.710	133	43.07	198	22.523	102	40.07	170
Mar. 2.0	47.399	171	65.23	242	53.221	143	58.17	78	1.843	169	41.09	209	22.625	138	38.37	145
11.9	47.570	223	62.81	205	53.364	176	57.39	97	2.012	207	39.00	214	22.763	177	36.92	110
21.9	47.793	273	60.76	159	53.540	206	56.42	117	2.219	243	36.86	216	22.940	211	35.82	70
31.9	48.066	318	59.17	108	53.746	233	55.25	134	2.462	275	34.70	216	23.151	245	35.12	26 —
Apr. 10.9	48.384	354	58.09	53 —	53.979	261	53.91	150	2.737	307	32.54	209	23.396	273	34.86	18
20.8	48.738	382	57.56	6	54.240	283	52.41	164	3.044	331	30.45	201	23.669	297	35.04	64
30.8	49.120	401	57.62	63	54.523	300	50.77	171	3.375	353	28.44	186	23.966	313	35.68	109
May 10.8	49.521	407	58.25	118	54.823	311	49.06	177	3.728	365	26.58	167	24.279	323	36.77	149
20.7	49.928	404	59.43	170	55.134	316	47.29	176	4.093	370	24.91	144	24.602	325	38.26	185
30.7	50.332	389	61.13	216	55.450	313	45.53	171	4.463	368	23.47	116	24.927	318	40.11	217
June 9.7	50.721	364	63.29	256	55.763	301	43.82	160	4.831	354	22.31	89	25.245	303	42.28	241
19.7	51.085	332	65.85	289	56.064	283	42.22	147	5.185	333	21.42	54	25.548	281	44.69	261
29.6	51.417	288	68.74	315	56.347	256	40.75	130	5.518	302	20.88	22 —	25.829	250	47.30	272
July 9.6	51.705	238	71.89	332	56.603	223	39.45	109	5.820	264	20.66	11	26.079	213	50.02	276
19.6	51.943	182	75.21	343	56.826	186	38.36	87	6.084	219	20.77	43	26.292	173	52.78	276
29.6	52.125	125	78.64	345	57.012	143	37.49	62	6.303	167	21.20	73	26.465	128	55.54	268
Aug. 8.5	52.250	65	82.09	340	57.155	97	36.87	40	6.470	114	21.93	98	26.593	82	58.22	254
18.5	52.315	6 —	85.49	328	57.252	51	36.47	16 —	6.584	57	22.91	120	26.675	35 —	60.76	238
28.5	52.321	52	88.77	308	57.303	7 —	36.31	3	6.641	2 —	24.11	135	26.710	9	63.14	215
Sept. 7.4	52.269	104	91.85	285	57.310	35	36.34	23	6.643	49	25.46	145	26.701	50	65.29	191
17.4	52.165	152	94.70	253	57.275	72	36.57	36	6.594	95	26.91	147	26.651	88	67.20	162
27.4	52.013	191	97.23	217	57.203	102	36.93	48	6.499	136	28.38	143	26.563	118	68.82	131
Oct. 7.4	51.822	224	99.40	177	57.101	126	37.41	56	6.363	166	29.81	131	26.445	141	70.13	99
17.3	51.598	246	101.17	132	56.975	140	37.97	61	6.197	186	31.12	114	26.304	157	71.12	63
27.3	51.352	261	102.49	84	56.835	147	38.58	61	6.011	196	32.26	93	26.147	167	71.75	28 —
Nov. 6.3	51.091	265	103.33	34 —	56.688	146	39.19	60	5.815	196	33.19	64	25.980	167	72.03	7
16.3	50.826	261	103.67	19	56.542	138	39.79	56	5.619	187	33.83	36	25.813	160	71.96	44
26.2	50.565	249	103.48	70	56.404	122	40.35	50	5.432	169	34.19	6 —	25.653	151	71.52	79
Dec. 6.2	50.316	229	102.78	122	56.282	105	40.85	43	5.263	145	34.25	26	25.502	134	70.73	112
16.2	50.087	201	101.56	169	56.177	81	41.28	36	5.118	115	33.99	55	25.368	111	69.61	142
26.1	49.886	167	99.87	210	56.096	56	41.64	24	5.003	81	33.44	84	25.257	87	68.19	167
36.1	49.719		97.77		56.040		41.88		4.922		32.60		25.170		66.52	
Mean Place	47.969		63.65		52.886		61.72		1.695		47.51		22.539		36.97	
Sec δ, Tan δ	1.523		+1.148		1.030		–0.248		1.265		–0.774		1.108		+0.478	
$D_\psi \alpha$, $D_\omega \alpha$	+0.04		–0.06		+0.06		+0.01		+0.07		+0.04		+0.05		–0.03	
$D_\psi \delta$, $D_\omega \delta$	+0.3		–0.6		+0.3		–0.5		+0.3		–0.5		+0.3		–0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**79 Draconis.** Mag. 6.6				**20 Pegasi.** Mag. 5.7				**ε Indi.** Mag. 4.7				**α Aquarii.** Mag. 3.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 51		+73 19		21 57		+12 43		21 57		−57 6		22 1		− 0 42	
	s		″		s		″		s		″		s		″	
Jan. 1.1	48.41	49	29.72	223	8.692	55	62.43	131	9.803	121	76.62	183	37.639	47	43.89	77
11.1	47.92	39	27.49	265	8.637	27	61.12	138	9.682	64	74.79	216	37.592	22	44.66	74
21.1	47.53	27	24.84	298	8.610	— 1	59.74	138	9.618	7	72.63	243	37.570	— 4	45.40	65
31.1	47.26	13	21.86	317	8.611	32	58.36	133	9.611	— 53	70.20	264	37.574	34	46.05	56
Feb. 10.0	47.13	0	18.69	324	8.643	62	57.03	120	9.664	110	67.56	278	37.608	63	46.61	41
20.0	47.13	14	15.45	318	8.705	94	55.83	101	9.774	168	64.78	286	37.671	93	47.02	20
Mar. 2.0	47.27	29	12.27	298	8.799	129	54.82	76	9.942	224	61.92	289	37.764	126	47.22	— 2
11.9	47.56	41	9.29	269	8.928	162	54.06	47	10.166	279	59.03	285	37.890	158	47.20	27
21.9	47.97	53	6.60	227	9.090	194	53.59	12	10.445	330	56.18	276	38.048	188	46.93	54
31.9	48.50	63	4.33	177	9.284	226	53.47	— 24	10.775	377	53.42	260	38.236	219	46.39	83
Apr. 10.9	49.13	71	2.56	121	9.510	254	53.71	61	11.152	419	50.82	240	38.455	247	45.56	110
20.8	49.84	78	1.35	62	9.764	276	54.32	96	11.571	456	48.42	214	38.702	270	44.46	133
30.8	50.62	81	0.73	— 1	10.040	294	55.28	131	12.027	484	46.28	184	38.972	289	43.13	157
May 10.8	51.43	81	0.74	62	10.334	307	56.59	162	12.511	503	44.44	149	39.261	302	41.56	173
20.8	52.24	81	1.36	120	10.641	310	58.21	186	13.014	511	42.95	110	39.563	307	39.83	186
30.7	53.05	75	2.56	177	10.951	305	60.07	208	13.525	508	41.85	69	39.870	305	37.97	195
June 9.7	53.80	71	4.33	227	11.256	296	62.15	219	14.033	493	41.16	26	40.175	296	36.02	197
19.7	54.51	63	6.60	270	11.552	277	64.34	233	14.526	465	40.90	— 18	40.471	279	34.05	194
29.6	55.14	54	9.30	308	11.829	250	66.67	233	14.991	425	41.08	60	40.750	254	32.11	187
July 9.6	55.68	43	12.38	335	12.079	217	69.00	230	15.416	372	41.68	102	41.004	222	30.24	175
19.6	56.11	31	15.73	358	12.296	179	71.30	223	15.788	313	42.70	139	41.226	187	28.49	158
29.6	56.42	18	19.31	370	12.475	139	73.53	209	16.101	242	44.09	173	41.413	146	26.91	141
Aug. 8.5	56.60	7	23.01	375	12.614	94	75.62	193	16.343	168	45.82	199	41.559	103	25.50	118
18.5	56.67	— 5	26.76	373	12.708	50	77.55	172	16.511	88	47.81	220	41.662	59	24.32	98
28.5	56.62	19	30.49	362	12.758	7	79.27	151	16.599	10	50.01	231	41.721	16	23.34	74
Sept. 7.5	56.43	28	34.11	344	12.765	— 33	80.78	126	16.609	— 65	52.32	234	41.737	— 23	22.60	53
17.4	56.15	39	37.55	318	12.732	68	82.04	102	16.544	136	54.66	227	41.714	60	22.07	31
27.4	55.76	49	40.73	287	12.664	97	83.06	75	16.408	197	56.93	210	41.654	89	21.76	12
Oct. 7.4	55.27	56	43.60	247	12.567	121	83.81	50	16.211	245	59.03	187	41.565	112	21.64	— 5
17.3	54.71	63	46.07	202	12.446	135	84.31	23	15.966	280	60.90	153	41.453	128	21.69	23
27.3	54.08	69	48.09	151	12.311	144	84.54	— 2	15.686	301	62.43	115	41.325	137	21.92	35
Nov. 6.3	53.39	71	49.60	96	12.167	146	84.52	28	15.385	308	63.58	70	41.188	138	22.27	48
16.3	52.68	71	50.56	38	12.021	140	84.24	50	15.077	299	64.28	24	41.050	133	22.75	58
26.2	51.97	71	50.94	— 22	11.881	130	83.74	75	14.778	279	64.52	— 24	40.917	121	23.33	68
Dec. 6.2	51.26	68	50.72	83	11.751	113	82.99	94	14.499	246	64.28	72	40.796	107	24.01	73
16.2	50.58	62	49.89	142	11.638	95	82.05	114	14.253	205	63.56	117	40.689	88	24.74	77
26.2	49.96	54	48.47	195	11.543	72	80.91	127	14.048	157	62.39	156	40.601	65	25.51	80
36.1	49.42		46.52		11.471		79.64		13.891		60.83		40.536		26.31	
Mean Place	50.682		8.01		8.560		52.90		10.319		70.29		37.459		49.76	
Sec δ, Tan δ	3.485		+3.338		1.025		+0.226		1.842		−1.547		1.000		−0.012	
$D_\psi\alpha$, $D_\omega\alpha$	+0.01		−0.19		+0.06		−0.01		+0.08		+0.09		+0.06		0.00	
$D_\psi\delta$, $D_\omega\delta$	+0.3		−0.5		+0.3		−0.5		+0.3		−0.5		+0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ι Aquarii. Mag. 4.4				20 Cephei. Mag. 5.4				α Gruis. Mag. 2.2				ι Pegasi. Mag. 4.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 22 2		° ′ −14 15		h m 22 2		° ′ +62 23		h m 22 3		° ′ −47 20		h m 22 3		° ′ +24 56	
	s		″		s		″		s		″		s		″	
Jan. 1.1	4.010	48	45.42	16	31.91	28	45.17	219	7.871	98	79.95	141	14.452	76	69.15	168
11.1	3.962	20	45.58	3	31.63	21	42.98	258	7.773	54	78.54	173	14.376	48	67.47	183
21.1	3.942	8	45.61	11	31.42	14	40.40	288	7.719	11	76.81	200	14.328	17	65.64	192
31.1	3.950	37	45.50	27	31.28	7	37.52	306	7.708	34	74.81	221	14.311	17	63.72	192
Feb. 10.0	3.987	67	45.23	44	31.21	1	34.46	312	7.742	79	72.60	238	14.328	50	61.80	184
20.0	4.054	99	44.79	63	31.22	9	31.34	303	7.821	125	70.22	251	14.378	87	59.96	167
Mar. 2.0	4.153	130	44.16	82	31.31	18	28.31	286	7.946	169	67.71	259	14.465	125	58.29	142
11.9	4.283	163	43.34	102	31.49	25	25.45	253	8.115	214	65.12	262	14.590	163	56.87	110
21.9	4.446	193	42.32	122	31.74	34	22.92	213	8.329	257	62.50	257	14.753	200	55.77	72
31.9	4.639	225	41.10	139	32.08	40	20.79	163	8.586	296	59.93	252	14.953	233	55.05	31
Apr. 10.9	4.864	253	39.71	155	32.48	46	19.16	108	8.882	333	57.41	240	15.186	264	54.74	14
20.8	5.117	276	38.16	169	32.94	50	18.08	49	9.215	365	55.01	222	15.450	289	54.88	58
30.8	5.393	295	36.47	177	33.44	52	17.59	11	9.580	391	52.79	199	15.739	310	55.46	101
May 10.8	5.688	310	34.70	181	33.96	55	17.70	72	9.971	407	50.80	173	16.049	322	56.47	142
20.8	5.998	316	32.89	180	34.51	54	18.42	128	10.378	417	49.07	141	16.371	326	57.89	179
30.7	6.314	315	31.09	176	35.05	52	19.70	182	10.795	416	47.66	107	16.697	322	59.68	210
June 9.7	6.629	305	29.33	165	35.57	49	21.52	231	11.211	404	46.59	69	17.019	309	61.78	234
19.7	6.934	290	27.68	151	36.06	45	23.83	272	11.615	383	45.90	31	17.328	290	64.12	255
29.6	7.224	263	26.17	132	36.51	39	26.55	307	11.998	351	45.59	10	17.618	262	66.67	266
July 9.6	7.487	234	24.85	112	36.90	32	29.62	333	12.349	310	45.69	46	17.880	227	69.33	273
19.6	7.721	196	23.73	89	37.22	25	32.95	353	12.659	259	46.15	85	18.107	188	72.06	272
29.6	7.917	154	22.84	63	37.47	18	36.48	364	12.918	204	47.00	118	18.295	143	74.78	265
Aug. 8.5	8.071	109	22.21	40	37.65	10	40.12	367	13.122	141	48.18	145	18.438	98	77.43	253
18.5	8.180	64	21.81	16	37.75	2	43.79	363	13.263	79	49.63	169	18.536	52	79.96	237
28.5	8.244	19	21.65	4	37.77	6	47.42	350	13.342	16	51.32	183	18.588	7	82.33	216
Sept. 7.5	8.263	23	21.69	26	37.71	13	50.92	332	13.358	47	53.15	192	18.595	35	84.49	192
17.4	8.240	61	21.95	40	37.58	21	54.24	305	13.311	103	55.07	192	18.560	72	86.41	164
27.4	8.179	91	22.35	52	37.37	26	57.29	273	13.208	151	56.99	183	18.488	103	88.05	135
Oct. 7.4	8.088	118	22.87	60	37.11	31	60.02	235	13.057	189	58.82	165	18.385	129	89.40	102
17.3	7.970	134	23.47	66	36.80	35	62.37	190	12.868	218	60.47	142	18.256	147	90.42	69
27.3	7.836	142	24.13	66	36.45	38	64.27	139	12.650	235	61.89	112	18.109	157	91.11	35
Nov. 6.3	7.694	144	24.79	65	36.07	40	65.66	87	12.415	240	63.01	76	17.952	160	91.46	1
16.3	7.550	139	25.44	60	35.67	40	66.53	30	12.175	234	63.77	38	17.792	158	91.47	36
26.2	7.411	128	26.04	54	35.27	40	66.83	27	11.941	217	64.15	1	17.634	149	91.11	70
Dec. 6.2	7.283	109	26.58	46	34.87	38	66.56	86	11.724	193	64.14	43	17.485	135	90.41	101
16.2	7.174	90	27.04	37	34.49	35	65.70	142	11.531	161	63.71	82	17.350	116	89.40	132
26.2	7.084	65	27.41	25	34.14	31	64.28	193	11.370	124	62.89	118	17.234	94	88.08	157
36.1	7.019		27.66		33.83		62.35		11.246		61.71		17.140		86.51	
Mean Place	3.847		47.63		32.767		24.23		8.061		74.79		14.360		56.23	
Sec δ, Tan δ	1.032		−0.254		2.158		+1.912		1.476		−1.086		1.103		+0.465	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		+0.01		+0.04		−0.11		+0.08		+0.06		+0.05		−0.03	
$D_\psi\delta$, $D_\omega\delta$	+0.3		−0.5		+0.3		−0.5		+0.3		−0.5		+0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Pegasi. Mag. 3.7				π Pegasi. Mag. 4.4				ζ Cephei. Mag. 3.6				24 Cephei. Mag. 5.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 22 6		° ′ + 5 47		h m 22 6		° ′ +32 46		h m 22 8		° ′ +57 47		h m 22 8		° ′ +71 56	
	s		″		s		″		s		″		s		″	
Jan. 1.1	7.055		63.86		23.355		64.11		1.983		86.54		13.52		53.54	
		54		102		96		185		227		214		48		207
11.1	7.001		62.84		23.259		62.26		1.756		84.40		13.04		51.47	
		29		104		66		208		179		252		38		252
21.1	6.972		61.80		23.193		60.18		1.577		81.88		12.66		48.95	
		3		101		33		221		122		279		28		285
31.1	6.969	—	60.79		23.160	—	57.97		1.455		79.09		12.38		46.10	
		27		93		3		226		58		297		17		311
Feb. 10.0	6.996		59.86		23.163		55.71		1.397	—	76.12		12.21		42.99	
		57		78		41		221		10		302		4		320
20.0	7.053		59.08		23.204		53.50		1.407		73.10		12.17	—	39.79	
		87		60		83		205		81		295		9		319
Mar. 2.0	7.140		58.48		23.287		51.45		1.488		70.15		12.26		36.60	
		120		37		124		182		154		275		22		303
12.0	7.260		58.11		23.411		49.63		1.642		67.40		12.48		33.57	
		154		8		167		148		223		244		34		277
21.9	7.414		58.03	—	23.578		48.15		1.865		64.96		12.82		30.80	
		185		22		207		109		291		204		45		238
31.9	7.599		58.25		23.785		47.06		2.156		62.92		13.27		28.42	
		217		53		244		65		349		156		57		191
Apr. 10.9	7.816		58.78		24.029		46.41		2.505		61.36		13.84		26.51	
		246		85		277		17		401		102		64		136
20.8	8.062		59.63		24.306		46.24	—	2.906		60.34		14.48		25.15	
		269		115		306		32		440		43		70		79
30.8	8.331		60.78		24.612		46.56		3.346		59.91	—	15.18		24.36	
		289		144		326		80		467		16		75		18
May 10.8	8.620		62.22		24.938		47.36		3.813		60.07		15.93		24.18	—
		302		168		340		127		483		74		76		45
20.8	8.922		63.90		25.278		48.63		4.296		60.81		16.69		24.63	
		309		186		342		169		484		131		77		103
30.7	9.231		65.76		25.620		50.32		4.780		62.12		17.46		25.66	
		306		201		339		207		471		183		73		159
June 9.7	9.537		67.77		25.959		52.39		5.251		63.95		18.19		27.25	
		297		211		325		238		446		229		69		211
19.7	9.834		69.88		26.284		54.77		5.697		66.24		18.88		29.36	
		281		213		302		264		410		270		63		256
29.7	10.115		72.01		26.586		57.41		6.107		68.94		19.51		31.92	
		255		209		272		281		362		304		53		296
July 9.6	10.370		74.10		26.858		60.22		6.469		71.98		20.04		34.88	
		224		204		237		293		306		328		46		326
19.6	10.594		76.14		27.095		63.15		6.775		75.26		20.50		38.14	
		189		191		194		297		244		348		35		351
29.6	10.783		78.05		27.289		66.12		7.019		78.74		20.85		41.65	
		149		175		148		296		176		358		24		367
Aug. 8.5	10.932		79.80		27.437		69.08		7.195		82.32		21.09		45.32	
		105		157		100		287		107		360		12		374
18.5	11.037		81.37		27.537		71.95		7.302		85.92		21.21		49.06	
		61		136		51		273		35		353		0		375
28.5	11.098		82.73		27.588		74.68		7.337	—	89.45		21.21		52.81	
		20		112		4		253		32		343		10		367
Sept. 7.5	11.118	—	83.85		27.592	—	77.21		7.305		92.88		21.11		56.48	
		21		91		41		231		98		324		20		351
17.4	11.097		84.76		27.551		79.52		7.207		96.12		20.91		59.99	
		56		66		80		202		157		296		31		329
27.4	11.041		85.42		27.471		81.54		7.050		99.08		20.60		63.28	
		86		44		114		171		210		264		40		299
Oct. 7.4	10.955		85.86		27.357		83.25		6.840		101.72		20.20		66.27	
		110		22		140		136		254		226		48		262
17.4	10.845		86.08		27.217		84.61		6.586		103.98		19.72		68.89	
		126		1		162		100		288		183		55		220
27.3	10.719		86.09	—	27.055		85.61		6.298		105.81		19.17		71.09	
		135		19		173		60		316		135		59		170
Nov. 6.3	10.584		85.90		26.882		86.21		5.982		107.16		18.58		72.79	
		138		36		179		20		330		82		62		117
16.3	10.446		85.54		26.703		86.41	—	5.652		107.98		17.96		73.96	
		134		54		179		22		336		28		65		58
26.2	10.312		85.00		26.524		86.19		5.316		108.26	—	17.31		74.54	—
		124		70		170		63		332		28		64		2
Dec. 6.2	10.188		84.30		26.354		85.56		4.984		107.98		16.67		74.52	
		109		83		157		102		317		85		63		62
16.2	10.079		83.47		26.197		84.54		4.667		107.13		16.04		73.90	
		93		93		139		138		290		139		59		122
26.2	9.986		82.54		26.058		83.16		4.377		105.74		15.45		72.68	
		70		101		115		172		257		188		52		177
36.1	9.916		81.53		25.943		81.44		4.120		103.86		14.93		70.91	
Mean Place	6.859		56.15		23.322		49.08		2.522		66.07		15.199		31.04	
Sec δ, Tan δ	1.005		+0.102		1.189		+0.644		1.877		+1.588		3.227		+3.068	
Dψα, Dωα	+0.06		−0.01		+0.05		−0.04		+0.04		−0.09		+0.02		−0.18	
Dψδ, Dωδ	+0.3		−0.5		+0.3		−0.5		+0.4		−0.5		+0.4		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Aquarii. Mag. 4.3				α Tucanæ. Mag. 2.9				γ Aquarii. Mag. 4.0				31 Pegasi. Mag. 4.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 22 12		° ′ − 8 10		h m 22 12		° ′ −60 39		h m 22 17		° ′ − 1 47		h m 22 17		° ′ +11 47	
	s		″		s		″		s		″		s		″	
Jan. 1.1	33.854	54	69.65	44	57.16	18	56.83	194	28.639	58	39.49	70	32.108	66	57.18	120
11.1	33.800	29	70.09	35	56.98	13	54.89	230	28.581	34	40.19	66	32.042	44	55.98	127
21.1	33.771	3	70.44	23	56.85	7	52.59	262	28.547	10	40.85	58	31.998	16	54.71	128
31.1	33.768	— 25	70.67	9	56.78	0	49.97	284	28.537	— 19	41.43	47	31.982	— 12	53.43	122
Feb. 10.0	33.793	54	70.76	— 7	56.78	7	47.13	303	28.556	47	41.90	31	31.994	42	52.21	111
20.0	33.847	86	70.69	27	56.85	13	44.10	312	28.603	78	42.21	13	32.036	74	51.10	95
Mar. 2.0	33.933	117	70.42	47	56.98	20	40.98	316	28.681	110	42.34	— 10	32.110	108	50.15	70
12.0	34.050	149	69.95	71	57.18	25	37.82	313	28.791	142	42.24	35	32.218	142	49.45	43
21.9	34.199	181	69.24	93	57.43	32	34.69	302	28.933	176	41.89	61	32.360	177	49.02	10
31.9	34.380	213	68.31	117	57.75	37	31.67	289	29.109	208	41.28	87	32.537	211	48.92	— 24
Apr. 10.9	34.593	241	67.14	137	58.12	42	28.78	266	29.317	236	40.41	115	32.748	239	49.16	60
20.8	34.834	268	65.77	155	58.54	46	26.12	240	29.553	264	39.26	137	32.987	267	49.76	93
30.8	35.102	287	64.22	171	59.00	50	23.72	208	29.817	283	37.89	159	33.254	288	50.69	128
May 10.8	35.389	304	62.51	181	59.50	52	21.64	171	30.100	300	36.30	175	33.542	303	51.97	157
20.8	35.693	310	60.70	186	60.02	54	19.93	130	30.400	308	34.55	188	33.845	310	53.54	182
30.7	36.003	311	58.84	188	60.56	54	18.63	86	30.708	308	32.67	195	34.155	311	55.36	202
June 9.7	36.314	302	56.96	183	61.10	53	17.77	41	31.016	301	30.72	197	34.466	301	57.38	218
19.7	36.616	289	55.13	175	61.63	50	17.36	— 6	31.317	287	28.75	193	34.767	287	59.56	226
29.7	36.905	264	53.38	160	62.13	46	17.42	52	31.604	263	26.82	186	35.054	263	61.82	228
July 9.6	37.169	236	51.78	144	62.59	41	17.94	95	31.867	236	24.96	174	35.317	234	64.10	227
19.6	37.405	199	50.34	122	63.00	35	18.89	138	32.103	199	23.22	155	35.551	197	66.37	219
29.6	37.604	160	49.12	102	63.35	27	20.27	173	32.302	161	21.67	137	35.748	157	68.56	205
Aug. 8.5	37.764	115	48.10	77	63.62	18	22.00	204	32.463	118	20.30	115	35.905	114	70.61	190
18.5	37.879	73	47.33	54	63.80	11	24.04	225	32.581	75	19.15	93	36.019	71	72.51	170
28.5	37.952	29	46.79	31	63.91	2	26.29	239	32.656	32	18.22	69	36.090	28	74.21	149
Sept. 7.5	37.981	— 13	46.48	10	63.93	— 6	28.68	244	32.688	— 8	17.53	48	36.118	— 12	75.70	124
17.4	37.968	48	46.38	— 8	63.87	14	31.12	239	32.680	44	17.05	25	36.106	48	76.94	101
27.4	37.920	82	46.46	26	63.73	23	33.51	224	32.636	76	16.80	7	36.058	80	77.95	75
Oct. 7.4	37.838	105	46.72	38	63.50	27	35.75	199	32.560	101	16.73	— 11	35.978	103	78.70	51
17.4	37.733	124	47.10	49	63.23	31	37.74	166	32.459	119	16.84	26	35.875	123	79.21	25
27.3	37.609	134	47.59	55	62.92	35	39.40	126	32.340	129	17.10	39	35.752	134	79.46	2
Nov. 6.3	37.475	137	48.14	59	62.57	36	40.66	80	32.211	134	17.49	50	35.618	138	79.48	— 23
16.3	37.338	134	48.73	62	62.21	36	41.46	31	32.077	131	17.99	59	35.480	137	79.25	45
26.2	37.204	124	49.35	62	61.85	34	41.77	— 21	31.946	123	18.58	65	35.343	130	78.80	67
Dec. 6.2	37.080	110	49.97	61	61.51	32	41.56	71	31.823	110	19.23	72	35.213	117	78.13	85
16.2	36.970	92	50.58	56	61.19	27	40.85	121	31.713	95	19.95	73	35.096	102	77.28	103
26.2	36.878	71	51.14	51	60.92	21	39.64	166	31.618	73	20.68	74	34.994	83	76.25	117
36.1	36.807		51.65		60.71		37.98		31.545		21.42		34.911		75.08	
Mean Place	33.629		73.41		57.760		49.32		28.383		45.05		31.866		47.67	
Sec δ, Tan δ	1.010		−0.144		2.041		−1.779		1.000		−0.031		1.022		+0.209	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		+0.01		+0.08		+0.11		+0.06		0.00		+0.06		−0.01	
$D_\psi\delta$, $D_\omega\delta$	+0.4		−0.5		+0.4		−0.5		+0.4		−0.4		+0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Lacertæ. Mag. 4.6				π Aquarii. Mag. 4.6				σ Aquarii. Mag. 4.9				α Lacertæ. Mag. 3.8			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	22 20		+51 49		22 21		+ 0 57		22 26		−11 5		22 27		+49 51	
	s		″		s		″		s		″		s		″	
Jan. 1.2	22.157	190	42.21	199	8.691	60	63.47	81	22.023	62	31.33	32	57.076	184	76.10	189
11.1	21.967	151	40.22	235	8.631	39	62.66	78	21.961	41	31.65	20	56.892	146	74.21	227
21.1	21.816	105	37.87	264	8.592	13	61.88	72	21.920	15	31.85	6	56.746	106	71.94	255
31.1	21.711	55	35.23	280	8.579	14	61.16	62	21.905	12	31.91	9	56.640	58	69.39	271
Feb. 10.0	21.656	3	32.43	285	8.593	42	60.54	48	21.917	40	31.82	27	56.582	5	66.68	277
20.0	21.659	61	29.58	279	8.635	74	60.06	28	21.957	72	31.55	46	56.577	52	63.91	272
Mar. 2.0	21.720	123	26.79	261	8.709	106	59.78	7	22.029	104	31.09	68	56.629	110	61.19	255
12.0	21.843	184	24.18	232	8.815	138	59.71	19	22.133	135	30.41	88	56.739	169	58.64	226
21.9	22.027	242	21.86	193	8.953	172	59.90	46	22.268	170	29.53	111	56.908	225	56.38	191
31.9	22.269	296	19.93	147	9.125	203	60.36	75	22.438	203	28.42	131	57.133	278	54.47	145
Apr. 10.9	22.565	343	18.46	94	9.328	234	61.11	102	22.641	233	27.11	149	57.411	326	53.02	94
20.9	22.908	382	17.52	40	9.562	261	62.13	129	22.874	261	25.62	167	57.737	364	52.08	41
30.8	23.290	410	17.12	17	9.823	282	63.42	152	23.135	283	23.95	179	58.101	395	51.67	16
May 10.8	23.700	427	17.29	73	10.105	298	64.94	173	23.418	301	22.16.	186	58.496	412	51.83	70
20.8	24.127	433	18.02	128	10.403	307	66.67	187	23.719	311	20.30	190	58.908	421	52.53	124
30.7	24.560	427	19.30	177	10.710	308	68.54	197	24.030	313	18.40	189	59.329	417	53.77	173
June 9.7	24.987	408	21.07	223	11.018	301	70.51	201	24.343	308	16.51	181	59.746	402	55.50	218
19.7	25.395	382	23.30	261	11.319	287	72.52	202	24.651	296	14.70	169	60.148	377	57.68	256
29.7	25.777	342	25.91	293	11.606	265	74.54	195	24.947	275	13.01	155	60.525	341	60.24	286
July 9.6	26.119	296	28.84	318	11.871	236	76.49	185	25.222	247	11.46	135	60.866	300	63.10	313
19.6	26.415	243	32.02	334	12.107	202	78.34	169	25.469	212	10.11	112	61.166	248	66.23	329
29.6	26.658	184	35.36	344	12.309	163	80.03	152	25.681	173	8.99	88	61.414	193	69.52	339
Aug. 8.6	26.842	125	38.80	346	12.472	120	81.55	132	25.854	130	8.11	63	61.607	135	72.91	341
18.5	26.967	64	42.26	341	12.592	78	82.87	109	25.984	87	7.48	39	61.742	76	76.32	336
28.5	27.031	1	45.67	329	12.670	35	83.96	87	26.071	43	7.09	14	61.818	18	79.68	325
Sept. 7.5	27.032	55	48.96	309	12.705	6	84.83	62	26.114	1	6.95	7	61.836	37	82.93	306
17.4	26.977	108	52.05	285	12.699	41	85.45	42	26.115	38	7.02	26	61.799	89	85.99	283
27.4	26.869	154	54.90	254	12.658	74	85.87	20	26.077	71	7.28	42	61.710	135	88.82	252
Oct. 7.4	26.715	194	57.44	217	12.584	97	86.07	2	26.006	97	7.70	53	61.575	174	91.34	216
17.4	26.521	226	59.61	176	12.487	118	86.09	17	25.909	118	8.23	61	61.401	205	93.50	177
27.3	26.295	250	61.37	130	12.369	128	85.92	31	25.791	129	8.84	66	61.196	228	95.27	132
Nov. 6.3	26.045	265	62.67	81	12.241	132	85.61	45	25.662	135	9.50	68	60.968	245	96.59	85
16.3	25.780	271	63.48	29	12.109	131	85.16	56	25.527	134	10.18	67	60.723	252	97.44	33
26.3	25.509	270	63.77	24	11.978	123	84.60	67	25.393	127	10.85	63	60.471	252	97.77	18
Dec. 6.2	25.239	258	63.53	77	11.855	111	83.93	74	25.266	114	11.48	58	60.219	243	97.59	70
16.2	24.981	241	62.76	129	11.744	97	83.19	79	25.152	99	12.06	49	59.976	228	96.89	120
26.2	24.740	212	61.47	175	11.647	76	82.40	81	25.053	80	12.55	41	59.748	204	95.69	167
36.1	24.528		59.72		11.571		81.59		24.973		12.96		59.544		94.02	
Mean Place	22.348		22.35		8.418		57.11		21.744		34.13		57.137		56.36	
Sec δ, Tan δ	1.618		+1.272		1.000		+0.017		1.019		−0.196		1.552		+1.186	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.05		−0.08		+0.06		0.00		+0.06		+0.01		+0.05		−0.07	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	υ Aquarii. Mag. 5.3				226 B. Cephei. Mag. 5.7				η Aquarii. Mag. 4.1				10 Lacertæ. Mag. 4.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 22 30		° ′ −21 6		h m 22 30		° ′ +75 48		h m 22 31		° ′ − 0 31		h m 22 35		° ′ +38 37	
	s		″		s		″		s		″		s		″	
Jan. 1.2	16.123	71	85.40	9	49.61	68	56.08	175	11.993	67	61.39	75	37.670	134	59.15	173
11.1	16.052	47	85.31	30	48.93	56	54.33	225	11.926	46	62.14	69	37.536	106	57.42	203
21.1	16.005	20	85.01	49	48.37	46	52.08	267	11.880	21	62.83	64	37.430	75	55.39	223
31.1	15.985	— 9	84.52	69	47.91	31	49.41	297	11.859	— 4	63.47	52	37.355	38	53.16	235
Feb. 10.1	15.994	38	83.83	89	47.60	15	46.44	314	11.863	34	63.99	38	37.317	— 2	50.81	238
20.0	16.032	71	82.94	109	47.45	0	43.30	321	11.897	64	64.37	19	37.319	46	48.43	229
Mar. 2.0	16.103	104	81.85	127	47.45	17	40.09	312	11.961	95	64.56	— 3	37.365	92	46.14	211
12.0	16.207	137	80.58	145	47.62	35	36.97	293	12.056	129	64.53	28	37.457	142	44.03	184
21.9	16.344	173	79.13	162	47.97	48	34.04	261	12.185	164	64.25	54	37.599	186	42.19	148
31.9	16.517	207	77.51	176	48.45	63	31.43	219	12.349	196	63.71	82	37.785	232	40.71	106
Apr. 10.9	16.724	238	75.75	187	49.08	74	29.24	170	12.545	227	62.89	109	38.017	273	39.65	59
20.9	16.962	268	73.88	195	49.82	85	27.54	115	12.772	256	61.80	134	38.290	308	39.06	9
30.8	17.230	291	71.93	198	50.67	90	26.39	56	13.028	278	60.46	156	38.598	334	38.97	— 41
May 10.8	17.521	311	69.95	196	51.57	94	25.83	— 6	13.306	296	58.90	174	38.932	355	39.38	92
20.8	17.832	323	67.99	190	52.51	95	25.89	66	13.602	307	57.16	187	39.287	364	40.30	137
30.8	18.155	326	66.09	179	53.46	94	26.55	123	13.909	310	55.29	197	39.651	365	41.67	181
June 9.7	18.481	323	64.30	162	54.40	88	27.78	177	14.219	303	53.32	200	40.016	354	43.48	218
19.7	18.804	309	62.68	142	55.28	82	29.55	227	14.522	292	51.32	198	40.370	336	45.66	250
29.7	19.113	290	61.26	118	56.10	72	31.82	270	14.814	272	49.34	191	40.706	308	48.16	275
July 9.6	19.403	261	60.08	92	56.82	62	34.52	307	15.086	243	47.43	180	41.014	273	50.91	293
19.6	19.664	225	59.16	62	57.44	50	37.59	335	15.329	209	45.63	164	41.287	234	53.84	306
29.6	19.889	187	58.54	34	57.94	38	40.94	358	15.538	172	43.99	145	41.521	185	56.90	309
Aug. 8.6	20.076	141	58.20	6	58.32	22	44.52	371	15.710	131	42.54	124	41.706	137	59.99	306
18.5	20.217	95	58.14	— 21	58.54	9	48.23	378	15.841	88	41.30	101	41.843	87	63.05	299
28.5	20.312	49	58.35	45	58.63	— 5	52.01	375	15.929	46	40.29	78	41.930	38	66.04	284
Sept. 7.5	20.361	4	58.80	66	58.58	18	55.76	366	15.975	5	39.51	56	41.968	— 10	68.88	264
17.4	20.365	— 38	59.46	80	58.40	31	59.42	349	15.980	— 33	38.95	33	41.958	53	71.52	240
27.4	20.327	73	60.26	93	58.09	43	62.91	324	15.947	64	38.62	12	41.905	92	73.92	211
Oct. 7.4	20.254	102	61.19	97	57.66	54	66.15	292	15.883	90	38.50	— 5	41.813	126	76.03	178
17.4	20.152	125	62.16	97	57.12	64	69.07	252	15.793	109	38.55	23	41.687	151	77.81	142
27.3	20.027	138	63.13	95	56.48	71	71.59	207	15.684	124	38.78	36	41.536	171	79.23	101
Nov. 6.3	19.889	145	64.08	85	55.77	77	73.66	156	15.560	129	39.14	48	41.365	183	80.24	59
16.3	19.744	145	64.93	73	55.00	81	75.22	100	15.431	129	39.62	58	41.182	189	80.83	15
26.3	19.599	138	65.66	58	54.19	82	76.22	38	15.302	123	40.20	65	40.993	189	80.98	— 30
Dec. 6.2	19.461	125	66.24	42	53.37	82	76.60	— 22	15.179	113	40.85	73	40.804	182	80.68	74
16.2	19.336	108	66.66	23	52.55	79	76.38	84	15.066	99	41.58	76	40.622	168	79.94	115
26.2	19.228	89	66.89	6	51.76	73	75.54	144	14.967	83	42.34	76	40.454	151	78.79	155
36.1	19.139		66.95		51.03		74.10		14.884		43.10		40.303		77.24	
Mean Place	15.869		85.34		51.359		32.11		11.670		67.29		37.482		41.82	
Sec δ, Tan δ	1.072		−0.386		4.081		+3.956		1.000		−0.009		1.280		+0.799	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		+0.02		+0.02		−0.24		+0.06		0.00		+0.05		−0.05	
$D_\psi\delta$, $D_\omega\delta$	+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Piscis Australis. Mag. 4.2				ζ Pegasi. Mag. 3.6				β Gruis. Mag. 2.2				η Pegasi. Mag. 3.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 22 36		° ′ −27 27		h m 22 37		° ′ +10 24		h m 22 37		° ′ −47 18		h m 22 39		° ′ +29 47	
	s		″		s		″		s		″		s		″	
Jan. 1.2	10.927	83	61.96	35	25.662	77	38.41	109	50.207	137	37.94	119	12.477	109	64.64	157
11.1	10.844	57	61.61	60	25.585	57	37.32	115	50.070	100	36.75	156	12.368	86	63.07	179
21.1	10.787	30	61.01	83	25.528	33	36.17	116	49.970	62	35.19	187	12.282	58	61.28	194
31.1	10.757	1	60.18	107	25.495	7	35.01	112	49.908	19	33.32	216	12.224	27	59.34	201
Feb. 10.1	10.756	— 32	59.11	127	25.488	— 24	33.89	101	49.889	— 23	31.16	238	12.197	— 8	57.33	200
20.0	10.788	65	57.84	147	25.512	53	32.88	85	49.912	69	28.78	257	12.205	45	55.33	190
Mar. 2.0	10.853	100	56.37	167	25.565	89	32.03	61	49.981	114	26.21	269	12.250	87	53.43	169
12.0	10.953	135	54.70	181	25.654	124	31.42	36	50.095	161	23.52	277	12.337	129	51.74	143
21.9	11.088	173	52.89	195	25.778	159	31.06	6	50.256	207	20.75	280	12.466	171	50.31	107
31.9	11.261	208	50.94	205	25.937	193	31.00	— 27	50.463	252	17.95	276	12.637	211	49.24	68
Apr. 10.9	11.469	242	48.89	213	26.130	227	31.27	61	50.715	294	15.19	268	12.848	249	48.56	25
20.9	11.711	272	46.76	214	26.357	256	31.88	94	51.009	332	12.51	253	13.097	280	48.31	— 21
30.8	11.983	299	44.62	210	26.613	280	32.82	126	51.341	365	9.98	234	13.377	308	48.52	66
May 10.8	12.282	319	42.52	204	26.893	299	34.08	155	51.706	391	7.64	207	13.685	327	49.18	110
20.8	12.601	333	40.48	192	27.192	309	35.63	178	52.097	407	5.57	178	14.012	337	50.28	151
30.8	12.934	338	38.56	175	27.501	312	37.41	198	52.504	414	3.79	145	14.349	339	51.79	186
June 9.7	13.272	335	36.81	152	27.813	307	39.39	212	52.918	411	2.34	105	14.688	333	53.65	218
19.7	13.607	324	35.29	126	28.120	295	41.51	221	53.329	397	1.29	65	15.021	316	55.83	243
29.7	13.931	303	34.03	97	28.415	274	43.72	223	53.726	373	0.64	23	15.337	292	58.26	263
July 9.6	14.234	275	33.06	67	28.689	246	45.95	220	54.099	339	0.41	— 19	15.629	262	60.89	274
19.6	14.509	240	32.39	34	28.935	213	48.15	212	54.438	295	0.60	61	15.891	224	63.63	281
29.6	14.749	198	32.05	3	29.148	175	50.27	200	54.733	243	1.21	97	16.115	182	66.44	280
Aug. 8.6	14.947	152	32.02	— 29	29.323	134	52.27	184	54.976	185	2.18	134	16.297	138	69.24	274
18.5	15.099	104	32.31	56	29.457	92	54.11	164	55.161	125	3.52	162	16.435	91	71.98	261
28.5	15.203	56	32.87	81	29.549	50	55.75	143	55.286	62	5.14	184	16.526	46	74.59	246
Sept. 7.5	15.259	8	33.68	101	29.599	8	57.18	119	55.348	— 1	6.98	199	16.572	2	77.05	225
17.5	15.267	— 36	34.69	115	29.607	— 28	58.37	96	55.347	58	8.97	205	16.574	— 39	79.30	199
27.4	15.231	74	35.84	122	29.579	61	59.33	71	55.289	111	11.02	203	16.535	74	81.29	170
Oct. 7.4	15.157	107	37.06	125	29.518	87	60.04	48	55.178	156	13.05	192	16.461	103	82.99	141
17.4	15.050	130	38.31	120	29.431	107	60.52	23	55.022	191	14.97	172	16.358	128	84.40	107
27.3	14.920	147	39.51	111	29.324	123	60.75	2	54.831	216	16.69	146	16.230	144	85.47	72
Nov. 6.3	14.773	156	40.62	97	29.201	129	60.77	— 22	54.615	230	18.15	112	16.086	155	86.19	35
16.3	14.617	157	41.59	77	29.072	131	60.55	41	54.385	232	19.27	74	15.931	160	86.54	— 1
26.3	14.460	150	42.36	57	28.941	127	60.14	61	54.153	227	20.01	33	15.771	159	86.53	40
Dec. 6.2	14.310	138	42.93	32	28.814	119	59.53	79	53.926	209	20.34	— 9	15.612	152	86.13	77
16.2	14.172	121	43.25	8	28.695	108	58.74	94	53.717	189	20.25	52	15.460	141	85.36	112
26.2	14.051	101	43.33	— 17	28.587	91	57.80	106	53.528	159	19.73	92	15.319	124	84.24	141
36.2	13.950		43.16		28.496		56.74		53.369		18.81		15.195		82.83	
Mean Place	10.690		60.09		25.309		29.16		50.229		31.48		12.185		49.60	
Sec δ, Tan δ	1.127		−0.520		1.017		+0.184		1.475		−1.084		1.152		+0.573	
$D_\psi\alpha$, $D_\omega\alpha$	+0.07		+0.03		+0.06		−0.01		+0.07		+0.07		+0.06		−0.04	
$D_\psi\delta$, $D_\omega\delta$	+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Pegasi. Mag. 4.1				ε Gruis. Mag. 3.7				τ Aquarii. Mag. 4.2				μ Pegasi. Mag. 3.7			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	22 42		+23 8		22 43		−51 44		22 45		−14 0		22 46		+24 10	
	s		″		s		″		s		″		s		″	
Jan. 1.2	38.008	97	33.75	141	40.014	165	42.49	132	18.675	77	71.80	22	5.908	101	38.26	140
11.1	37.911	75	32.34	159	39.849	126	41.17	172	18.598	56	72.02	8	5.807	78	36.86	159
21.1	37.836	51	30.75	168	39.723	83	39.45	207	18.542	32	72.10	9	5.729	55	35.27	171
31.1	37.785	22	29.07	172	39.640	38	37.38	235	18.510	7	72.01	27	5.674	26	33.56	175
Feb. 10.1	37.763	10	27.35	166	39.602	10	35.03	200	18.503	21	71.74	46	5.648	6	31.81	171
20.0	37.773	44	25.69	156	39.612	59	32.43	277	18.524	51	71.28	67	5.654	41	30.10	159
Mar. 2.0	37.817	83	24.13	135	39.671	110	29.66	290	18.575	85	70.61	86	5.695	79	28.51	141
12.0	37.900	122	22.78	107	39.781	161	26.76	297	18.660	118	69.75	109	5.774	119	27.10	113
21.9	38.022	161	21.71	75	39.942	213	23.79	297	18.778	153	68.66	129	5.893	158	25.97	81
31.9	38.183	200	20.96	37	40.155	261	20.82	292	18.931	187	67.37	147	6.051	198	25.16	44
Apr. 10.9	38.383	234	20.59	2	40.416	307	17.90	282	19.118	219	65.90	166	6.249	233	24.72	4
20.9	38.617	267	20.61	44	40.723	351	15.08	263	19.337	252	64.24	179	6.482	266	24.68	38
30.8	38.884	293	21.05	85	41.074	386	12.45	242	19.589	276	62.45	190	6.748	292	25.06	80
May 10.8	39.177	312	21.90	124	41.460	414	10.03	212	19.865	296	60.55	195	7.040	313	25.86	119
20.8	39.489	324	23.14	160	41.874	433	7.91	179	20.161	311	58.60	196	7.353	325	27.05	156
30.8	39.813	327	24.74	190	42.307	443	6.12	142	20.472	317	56.64	192	7.678	329	28.61	187
June 9.7	40.140	321	26.64	217	42.750	442	4.70	101	20.789	315	54.72	183	8.007	324	30.48	215
19.7	40.461	307	28.81	236	43.192	429	3.69	57	21.104	304	52.89	168	8.331	310	32.63	235
29.7	40.768	286	31.17	250	43.621	402	3.12	12	21.408	287	51.21	151	8.641	290	34.98	250
July 9.6	41.054	257	33.67	258	44.023	368	3.00	33	21.695	261	49.70	129	8.931	261	37.48	258
19.6	41.311	221	36.25	259	44.391	322	3.33	75	21.956	230	48.41	103	9.192	226	40.06	264
29.6	41.532	182	38.84	254	44.713	267	4.08	117	22.186	191	47.38	77	9.418	187	42.70	257
Aug. 8.6	41.714	141	41.38	245	44.980	206	5.25	151	22.377	149	46.61	51	9.605	144	45.27	249
18.5	41.855	95	43.83	231	45.186	139	6.76	181	22.526	106	46.10	23	9.749	99	47.76	236
28.5	41.950	52	46.14	212	45.325	72	8.57	205	22.632	62	45.87	1	9.848	56	50.12	218
Sept. 7.5	42.002	9	48.26	191	45.397	3	10.62	218	22.694	19	45.88	25	9.904	12	52.30	197
17.5	42.011	29	50.17	166	45.400	61	12.80	224	22.713	20	46.13	43	9.916	26	54.27	172
27.4	41.982	64	51.83	140	45.339	119	15.04	221	22.693	56	46.56	59	9.890	61	55.99	145
Oct. 7.4	41.918	91	53.23	110	45.220	169	17.25	207	22.637	83	47.15	72	9.829	89	57.44	116
17.4	41.827	115	54.33	80	45.051	211	19.32	186	22.554	107	47.87	78	9.740	113	58.60	87
27.3	41.712	130	55.13	50	44.840	239	21.18	155	22.447	123	48.65	80	9.627	129	59.47	54
Nov. 6.3	41.582	140	55.63	17	44.601	258	22.73	119	22.324	131	49.45	80	9.498	140	60.01	22
16.3	41.442	145	55.80	15	44.343	263	23.92	78	22.193	134	50.25	75	9.358	145	60.23	11
26.3	41.297	144	55.65	46	44.080	257	24.70	33	22.059	129	51.00	67	9.213	144	60.12	43
Dec. 6.2	41.153	137	55.19	77	43.823	244	25.03	14	21.930	120	51.67	58	9.069	139	59.69	74
16.2	41.016	126	54.42	106	43.579	219	24.89	60	21.810	108	52.25	47	8.930	129	58.95	103
26.2	40.890	111	53.36	129	43.360	190	24.29	104	21.702	93	52.72	34	8.801	114	57.92	130
36.2	40.779		52.07		43.170		23.25		21.609		53.06		8.687		56.62	
Mean Place	37.657		20.58		40.108		35.00		18.314		73.51		5.536		24.76	
Sec δ, Tan δ	1.087		+0.427		1.615		−1.268		1.031		−0.250		1.096		+0.449	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		−0.03		+0.07		+0.08		+0.06		+0.02		+0.06		−0.03	
$D_\psi\delta$, $D_\omega\delta$	+0.4		−0.3		+0.4		−0.3		+0.4		−0.3		+0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ι Cephei. Mag. 3.7				λ Aquarii. Mag. 3.8				ρ Indi. Mag. 6.1				δ Aquarii. Mag. 3.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	22 46		+65 46		22 48		− 8 0		22 49		−70 29		22 50		−16 14	
	s		″		s		″		s		″		s		″	
Jan. 1.2	47.21		50.12		23.769		35.99		1.33		94.85		21.553		65.95	
11.1	46.83	38	48.44	168	23.693	76	36.45	46	0.93	40	92.86	199	21.471	82	66.10	15
21.1	46.52	31	46.28	216	23.635	58	36.80	35	0.60	33	90.44	242	21.410	61	66.09	1
31.1	46.26	26	43.73	255	23.599	36	37.02	22	0.36	24	87.63	281	21.372	38	65.88	21
Feb. 10.1	46.07	19	40.88	285	23.590	9	37.10	8	0.21	15	84.50	313	21.360	12	65.49	39
20.0	45.97	10	37.84	304	23.607	17	37.01	9	0.15	6	81.15	335	21.376	16	64.90	59
Mar. 2.0	45.97	0	34.76	308	23.653	46	36.72	29	0.20	5	77.64	351	21.421	45	64.09	81
12.0	46.06	9	31.74	302	23.733	80	36.21	51	0.34	14	74.08	356	21.501	80	63.08	101
22.0	46.26	20	28.94	280	23.847	114	35.47	74	0.58	24	70.52	356	21.614	113	61.85	123
31.9	46.54	28	26.44	250	23.995	148	34.51	96	0.91	33	67.05	347	21.764	150	60.44	141
Apr. 10.9	46.91	37	24.33	211	24.177	182	33.31	120	1.32	41	63.73	332	21.947	183	58.83	161
20.9	47.36	45	22.71	162	24.393	216	31.90	141	1.82	50	60.65	308	22.165	218	57.08	175
30.8	47.87	51	21.63	108	24.639	246	30.29	161	2.40	58	57.85	280	22.415	250	55.20	188
May 10.8	48.43	56	21.13	50	24.911	272	28.53	176	3.04	64	55.40	245	22.690	275	53.23	197
20.8	49.02	59	21.22	9	25.203	292	26.66	187	3.72	68	53.37	203	22.988	298	51.23	200
30.8	49.63	61	21.89	67	25.510	307	24.72	194	4.44	72	51.78	159	23.300	312	49.24	199
June 9.7	50.24	61	23.12	123	25.822	312	22.75	197	5.17	73	50.67	111	23.619	319	47.31	193
19.7	50.82	58	24.88	176	26.131	309	20.83	192	5.91	74	50.07	60	23.937	318	45.50	181
29.7	51.37	55	27.13	225	26.432	301	18.98	185	6.62	71	50.00	7	24.245	308	43.85	165
July 9.7	51.87	50	29.79	266	26.716	284	17.28	170	7.29	67	50.45	45	24.536	291	42.40	145
19.6	52.32	45	32.81	302	26.973	257	15.74	154	7.90	61	51.42	97	24.802	266	41.19	121
29.6	52.69	37	36.09	328	27.199	226	14.41	133	8.44	54	52.86	144	25.037	235	40.24	95
Aug. 8.6	52.98	29	39.60	351	27.390	191	13.32	109	8.89	45	54.72	186	25.234	197	39.57	67
18.5	53.20	22	43.23	363	27.539	149	12.46	86	9.23	34	56.94	222	25.390	156	39.18	39
28.5	53.31	11	46.91	368	27.645	106	11.88	58	9.45	22	59.46	252	25.502	112	39.08	10
Sept. 7.5	53.35	4	50.56	365	27.709	64	11.52	36	9.54	9	62.16	270	25.569	67	39.23	15
17.5	53.31	4	54.11	355	27.731	22	11.41	11	9.53	1	64.96	280	25.593	24	39.60	37
27.4	53.19	12	57.49	338	27.715	16	11.50	9	9.39	14	67.75	279	25.577	16	40.16	56
Oct. 7.4	52.99	20	60.62	313	27.665	50	11.79	29	9.13	26	70.41	266	25.526	51	40.89	73
17.4	52.73	26	63.45	283	27.586	79	12.21	42	8.78	35	72.85	244	25.443	83	41.72	83
27.4	52.40	33	65.89	244	27.486	100	12.75	54	8.33	45	74.94	209	25.338	105	42.59	87
Nov. 6.3	52.03	37	67.89	200	27.369	117	13.37	62	7.83	50	76.62	168	25.216	122	43.48	89
16.3	51.62	41	69.39	150	27.245	124	14.04	67	7.28	55	77.80	118	25.084	132	44.34	86
26.3	51.19	43	70.33	94	27.117	128	14.73	69	6.72	56	78.43	63	24.950	134	45.14	86
Dec. 6.2	50.75	44	70.72	39	26.992	125	15.42	69	6.15	57	78.47	4	24.818	132	45.82	68
16.2	50.30	45	70.50	22	26.875	117	16.07	65	5.60	55	77.94	53	24.693	125	46.40	58
26.2	49.87	43	69.70	80	26.769	106	16.68	61	5.10	50	76.84	110	24.582	111	46.84	44
36.2	49.47	40	68.33	137	26.678	91	17.21	53	4.65	45	75.19	165	24.486	96	47.11	27
Mean Place	47.566		26.79		23.374		39.48		2.372		84.74		21.179		66.91	
Sec δ, Tan δ	2.437		+2.223		1.010		−0.141		2.996		−2.824		1.042		−0.292	
Dψα, Dωα	+0.04		−0.14		+0.06		+0.01		+0.08		+0.18		+0.06		+0.02	
Dψδ, Dωδ	+0.4		−0.3		+0.4		−0.3		+0.4		−0.3		+0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Piscis Australis. (*Fomalhaut.*) Mag. 1.3				ο Andromedæ. Mag. 3.6				β Pegasi. Var. 2.2–2.7				α Pegasi. (*Markab.*) Mag. 2.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 22 53		° ′ −30 2		h m 22 58		° ′ +41 53		h m 22 59		° ′ +27 38		h m 23 0		° ′ +14 46	
	s		″		s		″		s		″		s		″	
Jan. 1.2	10.986	100	69.92	37	11.777	159	43.99	157	51.170	114	49.93	138	43.961	94	19.81	113
11.1	10.886	76	69.55	67	11.618	136	42.42	190	51.056	95	48.55	161	43.867	76	18.68	123
21.1	10.810	50	68.88	92	11.482	106	40.52	217	50.961	72	46.94	175	43.791	56	17.45	128
31.1	10.760	20	67.96	118	11.376	71	38.35	234	50.889	45	45.19	184	43.735	30	16.17	127
Feb. 10.1	10.740	11	66.78	141	11.305	30	36.01	242	50.844	11	43.35	184	43.705	3	14.90	120
20.0	10.751	44	65.37	164	11.275	16	33.59	239	50.833	25	41.51	175	43.702	29	13.70	108
Mar. 2.0	10.795	81	63.73	182	11.291	65	31.20	226	50.858	65	39.76	158	43.731	64	12.62	88
12.0	10.876	119	61.91	198	11.356	117	28.94	203	50.923	105	38.18	135	43.795	101	11.74	62
22.0	10.995	156	59.93	214	11.473	168	26.91	172	51.028	148	36.83	102	43.896	139	11.12	33
31.9	11.151	195	57.79	222	11.641	217	25.19	132	51.176	189	35.81	65	44.035	176	10.79	0
Apr. 10.9	11.346	231	55.57	228	11.858	264	23.87	87	51.365	230	35.16	25	44.211	213	10.79	35
20.9	11.577	266	53.29	230	12.122	304	23.00	39	51.595	264	34.91	17	44.424	246	11.14	71
30.8	11.843	295	50.99	225	12.426	337	22.61	12	51.859	294	35.08	61	44.670	273	11.85	104
May 10.8	12.138	317	48.74	215	12.763	362	22.73	61	52.153	316	35.69	103	44.943	294	12.89	137
20.8	12.455	336	46.59	202	13.125	376	23.34	111	52.469	331	36.72	140	45.237	311	14.26	165
30.8	12.791	344	44.57	182	13.501	381	24.45	157	52.800	337	38.12	177	45.548	317	15.91	189
June 9.7	13.135	343	42.75	157	13.882	377	26.02	197	53.137	334	39.89	207	45.865	315	17.80	209
19.7	13.478	336	41.18	130	14.259	360	27.99	232	53.471	323	41.96	231	46.180	306	19.89	221
29.7	13.814	317	39.88	99	14.619	336	30.31	263	53.794	302	44.27	249	46.486	288	22.10	229
July 9.7	14.131	291	38.89	65	14.955	303	32.94	285	54.096	275	46.76	263	46.774	263	24.39	230
19.6	14.422	257	38.24	30	15.258	263	35.79	302	54.371	241	49.39	269	47.037	233	26.69	227
29.6	14.679	217	37.94	4	15.521	219	38.81	311	54.612	202	52.08	268	47.270	196	28.96	219
Aug. 8.6	14.896	173	37.98	38	15.740	169	41.92	313	54.814	160	54.76	263	47.466	156	31.15	204
18.5	15.069	124	38.36	68	15.909	119	45.05	309	54.974	115	57.39	252	47.622	114	33.19	189
28.5	15.193	75	39.04	95	16.028	68	48.14	298	55.089	71	59.91	237	47.736	73	35.08	169
Sept. 7.5	15.268	26	39.99	116	16.096	18	51.12	283	55.160	27	62.28	216	47.809	32	36.77	147
17.5	15.294	19	41.15	132	16.114	28	53.95	261	55.187	12	64.44	194	47.841	7	38.24	122
27.4	15.275	60	42.47	141	16.086	70	56.56	235	55.175	48	66.38	167	47.834	39	39.46	99
Oct. 7.4	15.215	94	43.88	143	16.016	107	58.91	204	55.127	80	68.05	139	47.795	69	40.45	72
17.4	15.121	123	45.31	139	15.909	137	60.95	169	55.047	105	69.44	108	47.726	93	41.17	48
27.4	14.998	143	46.70	128	15.772	162	62.64	130	54.942	125	70.52	75	47.634	109	41.65	22
Nov. 6.3	14.855	154	47.98	111	15.610	179	63.94	88	54.817	138	71.27	42	47.525	122	41.87	1
16.3	14.701	159	49.09	91	15.431	191	64.82	43	54.679	146	71.69	6	47.403	127	41.86	27
26.3	14.542	156	50.00	66	15.240	197	65.25	2	54.533	149	71.75	29	47.276	128	41.59	49
Dec. 6.2	14.386	148	50.66	40	15.043	195	65.23	47	54.384	146	71.46	63	47.148	125	41.10	71
16.2	14.238	134	51.06	11	14.848	188	64.76	93	54.238	139	70.83	95	47.023	117	40.39	90
26.2	14.104	115	51.17	17	14.660	175	63.83	135	54.099	127	69.88	124	46.906	106	39.49	106
36.2	13.989		51.00		14.485		62.48		53.972		68.64		46.800		38.43	
Mean Place	10.690		66.93		11.426		25.32		50.719		35.22		43.476		9.09	
Sec δ, Tan δ	1.155		−0.579		1.343		+0.897		1.129		+0.524		1.034		+0.264	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		+0.04		+0.05		−0.06		+0.06		−0.03		+0.06		−0.02	
$D_\psi\delta$, $D_\omega\delta$	+0.4		−0.3		+0.4		−0.3		+0.4		−0.3		+0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	55 Pegasi. Mag. 4.7				C^2 Aquarii. Mag. 3.8				π Cephei. Mag. 4.6				ι Gruis. Mag. 4.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 23 2		° ′ + 8 58		h m 23 5		° ′ −21 36		h m 23 5		° ′ +74 56		h m 23 5		° ′ −45 40	
	s		″		s		″		s		″		s		″	
Jan. 1.2	55.884		26.63		8.196		45.53		18.42		83.06		46.894		75.87	
11.2	55.794	90	25.65	98	8.100	96	45.53	0	17.74	68	81.73	133	46.738	156	74.96	91
21.1	55.722	72	24.63	102	8.025	75	45.28	25	17.13	61	79.84	189	46.611	127	73.66	130
31.1	55.670	52	23.61	102	7.970	55	44.83	45	16.61	52	77.49	235	46.516	95	72.00	166
Feb. 10.1	55.641	29	22.63	98	7.941	29	44.14	69	16.22	39	74.76	273	46.458	58	70.02	198
20.0	55.639	2 —	21.74	89	7.940	1 —	43.23	91	15.97	25	71.76	300	46.440	18 —	67.77	225
Mar. 2.0	55.669	30	21.01	73	7.971	31	42.09	114	15.85	12 —	68.63	313	46.465	25	65.30	247
12.0	55.731	62	20.48	53	8.035	64	40.75	134	15.89	4	65.47	316	46.534	69	62.64	266
22.0	55.828	97	20.20	28	8.134	99	39.19	156	16.10	21	62.44	303	46.648	114	59.86	278
31.9	55.963	135	20.19	1 —	8.270	136	37.46	173	16.46	36	59.63	281	46.810	162	57.01	285
Apr. 10.9	56.134	171	20.50	31	8.444	174	35.57	189	16.96	50	57.18	245	47.018	208	54.15	286
20.9	56.341	207	21.12	62	8.653	209	33.56	201	17.60	64	55.16	202	47.271	253	51.33	282
30.9	56.579	238	22.05	93	8.897	244	31.45	211	18.33	73	53.64	152	47.567	296	48.60	273
May 10.8	56.846	267	23.30	125	9.169	272	29.31	214	19.14	81	52.68	96	47.898	331	46.05	255
20.8	57.135	289	24.80	150	9.467	298	27.17	214	20.01	87	52.30	38 —	48.260	362	43.71	234
30.8	57.440	305	26.55	175	9.782	315	25.10	207	20.92	91	52.52	22	48.645	385	41.64	207
June 9.7	57.752	312	28.48	193	10.106	324	23.14	196	21.83	91	53.31	79	49.044	399	39.90	174
19.7	58.064	312	30.55	207	10.433	327	21.33	181	22.71	88	54.67	136	49.445	401	38.52	138
29.7	58.366	302	32.69	214	10.754	321	19.74	159	23.56	85	56.57	190	49.840	395	37.55	97
July 9.7	58.653	287	34.86	217	11.058	304	18.39	135	24.34	78	58.91	234	50.218	378	37.00	55
19.6	58.915	262	37.00	214	11.340	282	17.34	105	25.04	70	61.68	277	50.567	349	36.88	12 —
29.6	59.148	233	39.05	205	11.591	251	16.58	76	25.63	59	64.80	312	50.880	313	37.19	31
Aug. 8.6	59.345	197	40.98	193	11.805	214	16.13	45	26.11	48	68.19	339	51.147	267	37.93	74
18.6	59.502	157	42.77	179	11.978	173	16.00	13 —	26.47	36	71.79	360	51.362	215	39.06	113
28.5	59.619	117	44.33	156	12.107	129	16.18	18	26.70	23	75.51	372	51.520	158	40.52	146
Sept. 7.5	59.694	75	45.69	136	12.191	84	16.62	44	26.80	10 —	79.27	376	51.617	97	42.25	173
17.5	59.729	35 —	46.82	113	12.231	40 —	17.31	69	26.78	2	83.02	375	51.655	38 —	44.19	194
27.4	59.727	2	47.72	90	12.229	2	18.19	88	26.63	15	86.64	362	51.636	19	46.26	207
Oct. 7.4	59.690	37	48.37	65	12.187	42	19.21	102	26.36	27	90.08	344	51.563	73	48.37	211
17.4	59.625	65	48.81	44	12.113	74	20.33	112	25.97	39	93.27	319	51.444	119	50.42	205
27.4	59.537	88	49.01	20 —	12.013	100	21.47	114	25.50	47	96.13	286	51.285	159	52.34	192
Nov. 6.3	59.433	104	49.00	1	11.893	120	22.58	111	24.93	57	98.57	244	51.098	187	54.02	168
16.3	59.315	118	48.79	21	11.761	132	23.62	104	24.29	64	100.53	196	50.890	208	55.42	140
26.3	59.193	122	48.41	38	11.622	139	24.54	92	23.58	71	101.96	143	50.673	217	56.46	104
Dec. 6.3	59.070	123	47.85	56	11.484	138	25.29	75	22.84	74	102.82	86	50.455	218	57.11	65
16.2	58.951	119	47.13	72	11.351	133	25.88	59	22.08	76	103.07	25 —	50.245	210	57.33	22 —
26.2	58.839	112	46.29	84	11.227	124	26.25	37	21.33	75	102.70	37	50.048	197	57.12	21
36.2	58.737	102	45.35	94	11.119	108	26.40	15	20.62	71	101.70	100	49.873	175	56.49	63
Mean Place	55.384		17.79		7.779		44.62		19.035		57.96		46.734		68.78	
Sec δ, Tan δ	1.012		+0.158		1.076		−0.396		3.853		+3.721		1.431		−1.024	
$D_\psi a$, $D_\omega a$	+0.06		−0.01		+0.06		+0.03		+0.04		−0.24		+0.07		+0.07	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2	

Washington Mean Time.	**59 Pegasi.** Mag. 5.2				**5 H^1. Cassiopeiæ.** Mag. 5.6				**φ Aquarii.** Mag. 4.4				**ψ Aquarii.** Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 23 7		° ′ + 8 16		h m 23 9		° ′ +56 43		h m 23 10		° ′ − 6 28		h m 23 11		° ′ − 9 31	
	s		″		s		″		s		″		s		″	
Jan. 1.2	39.303		56.83		22.940		38.02		8.178		65.59		39.466		42.08	
11.2	39.212	91	55.89	94	22.682	258	36.56	146	8.090	88	66.12	53	39.376	90	42.51	43
21.1	39.137	75	54.90	99	22.452	230	34.65	191	8.015	75	66.54	42	39.304	72	42.81	30
31.1	39.081	56	53.92	98	22.263	189	32.35	230	7.963	52	66.86	32	39.250	54	42.96	15
Feb. 10.1	39.049	32	52.98	94	22.125	138	29.76	259	7.931	32	67.03	17	39.219	31	42.96	0
20.0	39.043	6	52.14	84	22.044	81	27.00	276	7.927	4	67.01	2	39.214	5	42.76	20
Mar. 2.0	39.068	25	51.46	68	22.027	17	24.17	283	7.951	24	66.81	20	39.238	24	42.37	39
12.0	39.125	57	50.97	49	22.081	54	21.39	278	8.008	57	66.38	43	39.294	56	41.75	62
22.0	39.217	92	50.73	21	22.207	126	18.78	261	8.099	91	65.74	64	39.384	90	40.91	84
31.9	39.347	130	50.76	3	22.405	198	16.44	234	8.226	127	64.84	90	39.510	126	39.84	107
Apr. 10.9	39.514	167	51.10	34	22.671	266	14.47	197	8.388	162	63.72	112	39.672	162	38.55	129
20.9	39.717	203	51.75	65	23.002	331	12.95	152	8.588	200	62.36	136	39.870	198	37.06	149
30.9	39.952	235	52.70	95	23.388	386	11.93	102	8.818	230	60.78	158	40.100	230	35.37	169
May 10.8	40.216	264	53.96	126	23.818	430	11.46	47	9.077	259	59.08	170	40.361	261	33.54	183
20.8	40.502	286	55.47	151	24.280	462	11.54	8	9.361	284	57.22	186	40.645	284	31.61	193
30.8	40.806	304	57.22	175	24.764	484	12.17	63	9.661	300	55.26	196	40.947	302	29.61	200
June 9.7	41.118	312	59.14	192	25.254	490	13.33	116	9.971	310	53.27	199	41.259	312	27.60	201
19.7	41.430	312	61.19	205	25.739	485	15.00	167	10.282	311	51.28	199	41.573	314	25.64	196
29.7	41.733	303	63.33	214	26.205	466	17.13	213	10.587	305	49.37	191	41.880	307	23.77	187
July 9.7	42.021	288	65.49	216	26.639	434	19.65	252	10.877	290	47.58	179	42.175	295	22.04	173
19.6	42.286	265	67.59	210	27.033	394	22.50	285	11.146	269	45.96	162	42.448	273	20.51	153
29.6	42.522	236	69.62	203	27.378	345	25.63	313	11.387	241	44.51	145	42.691	243	19.19	132
Aug. 8.6	42.723	201	71.53	191	27.664	286	28.95	332	11.592	205	43.29	122	42.900	209	18.13	106
18.6	42.885	162	73.27	174	27.892	228	32.39	344	11.759	167	42.34	95	43.071	171	17.32	81
28.5	43.006	121	74.80	153	28.054	162	35.89	350	11.887	128	41.65	69	43.201	130	16.77	55
Sept. 7.5	43.086	80	76.13	133	28.150	96	39.36	347	11.972	85	41.20	45	43.289	88	16.50	27
17.5	43.126	40	77.22	109	28.183	33	42.74	338	12.017	45	40.97	23	43.336	47	16.47	3
27.4	43.129	3	78.08	86	28.155	28	45.96	322	12.021	4	40.98	1	43.342	6	16.68	21
Oct. 7.4	43.097	32	78.70	62	28.070	85	48.95	299	11.993	28	41.19	21	43.313	29	17.06	38
17.4	43.036	61	79.10	40	27.933	137	51.65	270	11.933	60	41.60	41	43.254	59	17.00	54
27.4	42.952	84	79.27	17	27.750	183	54.00	235	11.852	81	42.12	52	43.171	83	18.26	66
Nov. 6.3	42.850	102	79.25	2	27.530	220	55.95	195	11.748	104	42.73	61	43.069	102	19.00	74
16.3	42.735	115	79.02	23	27.278	252	57.43	148	11.634	114	43.42	69	42.954	115	19.77	77
26.3	42.615	120	78.62	40	27.004	274	58.42	99	11.515	119	44.13	71	42.833	121	20.54	77
Dec. 6.3	42.493	122	78.06	56	26.717	287	58.87	45	11.393	122	44.85	72	42.710	123	21.29	75
16.2	42.375	118	77.35	71	26.423	294	58.78	9	11.274	119	45.56	71	42.592	118	21.97	68
26.2	42.263	112	76.53	82	26.133	290	58.14	64	11.165	109	46.24	68	42.480	112	22.59	62
36.2	42.161	102	75.61	92	25.856	277	56.97	117	11.064	101	46.85	61	42.379	101	23.11	52
Mean Place	38.776		48.23		22.656		15.70		7.664		69.31		38.956		44.80	
Sec δ, Tan δ	1.011		+0.146		1.823		+1.524		1.006		−0.114		1.014		−0.168	
$D_\psi\alpha$, $D_\omega\alpha$	+0.06		−0.01		+0.05		−0.10		+0.06		+0.01		+0.06		+0.01	
$D_\psi\delta$, $D_\omega\delta$	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Tucanæ. Mag. 4.1				γ Piscium. Mag. 3.8				γ Sculptoris. Mag. 4.5				ο Cephei. Mag. 4.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 23 12		° ′ −58 40		h m 23 12		° ′ + 2 50		h m 23 14		° ′ −32 57		h m 23 15		° ′ +67 40	
	s		″		s		″		s		″		s		″	
Jan. 1.2	42.463	253	59.09	132	58.502	90	29.01	79	27.548	122	89.03	37	17.67	44	29.81	131
11.2	42.210	213	57.77	179	58.412	73	28.22	78	27.426	100	88.66	70	17.23	39	28.50	183
21.1	41.997	167	55.98	220	58.339	55	27.44	73	27.326	76	87.96	99	16.84	34	26.67	228
31.1	41.830	115	53.78	255	58.284	33	26.71	65	27.250	49	86.97	129	16.50	26	24.39	265
Feb. 10.1	41.715	61	51.23	283	58.251	7 —	26.06	52	27.201	16 —	85.68	155	16.24	17	21.74	289
20.1	41.654	1 —	48.40	306	58.244	21	25.54	36	27.185	17	84.13	179	16.07	8 —	18.85	304
Mar. 2.0	41.653	58	45.34	322	58.265	55	25.18	15 —	27.202	54	82.34	200	15.99	2	15.81	303
12.0	41.711	121	42.12	330	58.320	88	25.03	8	27.256	92	80.34	219	16.01	14	12.78	293
22.0	41.832	184	38.82	330	58.408	125	25.11	36	27.348	133	78.15	232	16.15	23	9.85	269
31.9	42.016	244	35.52	327	58.533	162	25.47	63	27.481	174	75.83	243	16.38	34	7.16	236
Apr. 10.9	42.260	304	32.25	315	58.695	198	26.10	90	27.655	215	73.40	247	16.72	43	4.80	192
20.9	42.564	358	29.10	296	58.893	230	27.00	118	27.870	251	70.93	248	17.15	51	2.88	143
30.9	42.922	407	26.14	271	59.123	260	28.18	142	28.121	285	68.45	243	17.66	57	1.45	88
May 10.8	43.329	448	23.43	241	59.383	283	29.60	166	28.406	313	66.02	232	18.23	62	0.57	32 —
20.8	43.777	478	21.02	204	59.666	301	31.26	182	28.719	333	63.70	216	18.85	65	0.25	27
30.8	44.255	498	18.98	162	59.967	310	33.08	195	29.052	347	61.54	196	19.50	65	0.52	84
June 9.8	44.753	504	17.36	117	60.277	312	35.03	204	29.399	351	59.58	169	20.15	65	1.36	140
19.7	45.257	498	16.19	70	60.589	305	37.07	206	29.750	346	57.89	138	20.80	62	2.76	187
29.7	45.755	478	15.49	19 —	60.894	291	39.13	203	30.096	333	56.51	103	21.42	58	4.63	236
July 9.7	46.233	445	15.30	30	61.185	269	41.16	195	30.429	309	55.48	67	22.00	53	6.99	275
19.6	46.678	400	15.60	78	61.454	241	43.11	183	30.738	278	54.81	30 —	22.53	46	9.74	308
29.6	47.078	343	16.38	125	61.695	206	44.94	165	31.016	239	54.51	9	22.99	38	12.82	334
Aug. 8.6	47.421	276	17.63	165	61.901	169	46.59	147	31.255	196	54.60	44	23.37	29	16.16	353
18.6	47.697	204	19.28	201	62.070	129	48.06	123	31.451	149	55.04	78	23.66	21	19.69	364
28.5	47.901	124	21.29	229	62.199	87	49.29	102	31.600	99	55.82	109	23.87	12	23.33	368
Sept. 7.5	48.025	45 —	23.58	246	62.286	48	50.31	77	31.699	49	56.91	131	23.99	3 -	27.01	364
17.5	48.070	32	26.04	256	62.334	8 -	51.08	54	31.748	2 —	58.22	150	24.02	6	30.65	351
27.5	48.038	106	28.60	255	62.342	25	51.62	31	31.750	43	59.72	161	23.96	14	34.16	334
Oct. 7.4	47.932	172	31.15	244	62.317	52	51.93	11 —	31.707	80	61.33	164	23.82	22	37.50	307
17.4	47.760	229	33.59	221	62.265	78	52.04	7	31.627	113	62.97	160	23.60	28	40.57	274
27.4	47.531	273	35.80	192	62.187	96	51.97	26	31.514	136	64.57	150	23.32	35	43.31	235
Nov. 6.3	47.258	306	37.72	151	62.091	109	51.71	39	31.378	152	66.07	132	22.97	40	45.66	188
16.3	46.952	323	39.23	107	61.982	115	51.32	52	31.226	162	67.39	108	22.57	43	47.54	135
26.3	46.629	329	40.30	57	61.867	119	50.80	62	31.064	164	68.47	81	22.14	46	48.89	81
Dec. 6.3	46.300	323	40.87	5 —	61.748	115	50.18	72	30.900	160	69.28	51	21.68	48	49.70	22 —
16.2	45.977	304	40.92	50	61.633	110	49.46	77	30.740	150	69.79	19 —	21.20	47	49.92	38
26.2	45.673	277	40.42	99	61.523	102	48.69	80	30.590	136	69.98	15	20.73	46	49.54	97
36.2	45.396		39.43		61.421		47.89		30.454		69.83		20.27		48.57	
Mean Place	42.587		49.40		57.950		22.23		27.173		84.71		17.576		5.43	
Sec δ, Tan δ	1.924		−1.643		1.001		+0.050		1.192		−0.649		2.632		+2.435	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.07		+0.11		+0.06		0.00		+0.06		+0.04		+0.05		−0.16	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Pegasi. Mag. 4.6				b^1 Aquarii. Mag. 4.2				4 Cassiopeiæ. Mag. 5.2				υ Pegasi. Mag. 4.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 23 16		° ′ +23 17		h m 23 18		° ′ −20 32		h m 23 21		° ′ +61 50		h m 23 21		° ′ +22 57	
	s		″		s		″		s		″		s		″	
Jan. 1.2	38.099		61.70		43.559		35.66		14.25		40.23		20.663		41.90	
11.2	37.986	113	60.48	122	43.456	103	35.75	9	13.92	33	38.93	130	20.550	113	40.72	118
21.1	37.888	98	59.08	140	43.371	85	35.61	— 14	13.61	31	37.13	180	20.451	99	39.36	136
31.1	37.810	78	57.55	153	43.306	65	35.25	36	13.35	26	34.91	222	20.371	80	37.87	149
Feb. 10.1	37.756	54	55.96	159	43.264	42	34.64	61	13.15	20	32.34	257	20.314	57	36.31	156
20.1	37.732	24	54.37	159	43.249	15	33.81	83	13.02	13	29.55	279	20.286	28	34.76	155
Mar. 2.0	37.741	— 9	52.86	151	43.264	— 15	32.74	107	12.96	6	26.63	292	20.290	— 4	33.28	148
12.0	37.786	45	51.50	136	43.311	47	31.46	128	12.98	— 2	23.71	292	20.332	42	31.95	133
22.0	37.872	86	50.38	112	43.395	84	29.97	149	13.08	10	20.92	279	20.413	81	30.85	110
31.9	38.000	128	49.56	82	43.516	121	28.27	170	13.27	19	18.37	255	20.535	122	30.03	82
Apr. 10.9	38.169	169	49.05	51	43.675	159	26.42	185	13.54	27	16.15	222	20.700	165	29.54	49
20.9	38.377	208	48.93	12	43.871	196	24.42	200	13.89	35	14.35	180	20.904	204	29.42	12
30.9	38.623	246	49.21	— 28	44.101	230	22.31	211	14.32	43	13.04	131	21.144	240	29.68	— 26
May 10.8	38.898	275	49.88	67	44.363	262	20.15	216	14.78	46	12.26	78	21.417	273	30.34	66
20.8	39.200	302	50.93	105	44.651	288	17.98	217	15.29	51	12.05	21	21.717	300	31.37	103
30.8	39.519	319	52.32	139	44.960	309	15.87	211	15.83	54	12.39	— 34	22.034	317	32.75	138
June 9.8	39.847	328	54.05	173	45.279	319	13.84	203	16.38	55	13.29	90	22.361	327	34.45	170
19.7	40.176	329	56.03	198	45.603	324	11.95	189	16.92	54	14.73	144	22.690	329	36.42	197
29.7	40.497	321	58.25	222	45.924	321	10.28	167	17.45	53	16.65	192	23.013	323	38.61	219
July 9.7	40.801	304	60.61	236	46.231	307	8.84	144	17.94	49	18.99	234	23.318	305	40.94	233
19.6	41.083	282	63.07	246	46.518	287	7.67	117	18.45	46	21.72	273	23.602	284	43.38	244
29.6	41.332	249	65.58	251	46.776	258	6.80	87	18.79	39	24.77	305	23.855	253	45.86	248
Aug. 8.6	41.546	214	68.07	249	46.999	223	6.26	54	19.12	33	28.05	328	24.074	219	48.33	247
18.6	41.720	174	70.49	242	47.184	185	6.03	23	19.38	26	31.49	344	24.253	179	50.73	240
28.5	41.852	132	72.79	230	47.326	142	6.11	— 8	19.58	20	35.05	356	24.391	138	53.01	228
Sept. 7.5	41.942	90	74.93	214	47.423	97	6.49	38	19.70	12	38.61	356	24.486	95	55.13	212
17.5	41.990	48	76.88	195	47.476	53	7.12	63	19.75	5	42.12	351	24.539	53	57.06	193
27.5	41.999	9	78.60	172	47.487	11	7.96	84	19.73	— 2	45.52	340	24.553	14	58.77	171
Oct. 7.4	41.971	— 28	80.08	148	47.459	— 28	8.96	100	19.64	9	48.72	320	24.531	— 22	60.24	147
17.4	41.912	59	81.28	120	47.397	62	10.06	110	19.48	16	51.65	293	24.478	53	61.45	121
27.4	41.828	84	82.22	94	47.309	88	11.22	116	19.28	20	54.25	260	24.398	80	62.37	92
Nov. 6.3	41.723	105	82.85	63	47.198	111	12.37	115	19.02	26	56.47	222	24.297	101	63.00	63
16.3	41.601	122	83.18	33	47.074	124	13.46	109	18.73	29	58.23	176	24.180	117	63.34	34
26.3	41.471	130	83.22	4	46.942	132	14.44	98	18.40	33	59.49	126	24.052	128	63.39	5
Dec. 6.3	41.335	136	82.94	— 28	46.807	135	15.28	84	18.05	35	60.22	73	23.919	133	63.13	— 26
16.2	41.199	136	82.37	57	46.674	133	15.93	65	17.69	36	60.38	16	23.785	134	62.59	54
26.2	41.067	132	81.52	85	46.549	125	16.40	47	17.33	36	59.96	— 42	23.654	131	61.77	82
36.2	40.942	125	80.42	110	46.436	113	16.64	24	16.98	35	58.97	99	23.529	125	60.71	106
Mean Place	37.518		48.21		43.066		34.81		13.896		16.69		20.049		28.51	
Sec δ, Tan δ	1.089		+0.431		1.068		−0.375		2.119		+1.868		1.086		+0.424	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		−0.03		+0.06		+0.02		+0.05		−0.12		+0.06		−0.03	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**κ Piscium.** Mag. 4.9				**θ Piscium.** Mag. 4.4				**70 Pegasi.** Mag. 4.7				**β Sculptoris.** Mag. 4.5			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 23 22		° ′ + 0 48		h m 23 23		° ′ + 5 56		h m 23 25		° ′ +12 18		h m 23 28		° ′ −38 15	
	s		″		s		″		s		″		s		″	
Jan. 1.2	47.410		49.46		52.121		10.00		4.039		58.69		38.299		65.70	
11.2	47.316	94	48.73	73	52.024	97	9.15	85	3.936	103	57.71	98	38.153	146	65.25	45
21.1	47.235	81	48.04	69	51.940	84	8.28	87	3.848	88	56.65	106	38.029	124	64.42	83
31.1	47.172	63	47.40	64	51.875	65	7.42	86	3.777	71	55.54	111	37.928	101	63.23	119
Feb. 10.1	47.129	43	46.86	54	51.829	46	6.63	79	3.726	51	54.45	109	37.857	71	61.72	151
20.1	47.112	17	46.45	41	51.809	20	5.95	68	3.702	24	53.43	102	37.816	41	59.92	180
Mar. 2.0	47.123	11	46.22	23	51.818	9	5.42	53	3.707	5	52.53	90	37.812	4	57.85	207
12.0	47.165	42	46.19	3	51.858	40	5.09	33	3.747	40	51.81	72	37.847	35	55.58	227
22.0	47.243	78	46.40	21	51.934	76	4.98	11	3.823	76	51.32	49	37.923	76	53.11	247
31.9	47.358	115	46.86	46	52.048	114	5.14	16	3.937	114	51.11	21	38.042	119	50.51	260
Apr. 10.9	47.509	151	47.59	73	52.198	150	5.58	44	4.090	153	51.20	9	38.206	164	47.83	268
20.9	47.697	188	48.59	100	52.386	188	6.32	74	4.281	191	51.60	40	38.413	207	45.11	272
30.9	47.920	223	49.85	126	52.609	223	7.34	102	4.508	227	52.34	74	38.661	248	42.42	269
May 10.8	48.173	253	51.33	148	52.863	254	8.64	130	4.766	258	53.40	106	38.945	284	39.81	261
20.8	48.450	277	53.03	170	53.141	278	10.19	155	5.049	283	54.75	135	39.262	317	37.34	247
30.8	48.747	297	54.88	185	53.438	297	11.94	175	5.352	303	56.37	162	39.604	342	35.06	228
June 9.8	49.055	308	56.84	196	53.748	310	13.85	191	5.665	313	58.21	184	39.963	359	33.04	202
19.7	49.366	311	58.86	202	54.060	312	15.88	203	5.982	317	60.21	200	40.330	367	31.32	172
29.7	49.672	306	60.89	203	54.366	306	17.96	208	6.293	311	62.35	214	40.694	364	29.95	137
July 9.7	49.966	294	62.88	199	54.660	294	20.05	209	6.589	296	64.54	219	41.047	353	28.97	98
19.6	50.239	273	64.77	189	54.934	274	22.08	203	6.866	277	66.74	220	41.380	333	28.38	59
29.6	50.485	246	66.52	175	55.180	246	24.02	194	7.114	248	68.90	216	41.682	302	28.22	16
Aug. 8.6	50.697	212	68.08	156	55.393	213	25.82	180	7.329	215	70.95	205	41.946	264	28.46	24
18.6	50.873	176	69.45	137	55.569	176	27.43	161	7.508	179	72.88	193	42.166	220	29.11	65
28.5	51.011	138	70.58	113	55.707	138	28.85	142	7.647	139	74.64	176	42.337	171	30.11	100
Sept. 7.5	51.107	96	71.47	89	55.803	96	30.04	119	7.745	98	76.19	155	42.456	119	31.44	133
17.5	51.163	56	72.12	65	55.859	56	31.00	96	7.802	57	77.53	134	42.522	66	33.03	159
27.5	51.181	18	72.54	42	55.877	18	31.72	72	7.822	20	78.64	111	42.538	16	34.80	177
Oct. 7.4	51.165	16	72.73	19	55.861	16	32.22	50	7.807	15	79.51	87	42.505	33	36.69	189
17.4	51.119	46	72.72	1	55.816	45	32.49	27	7.762	45	80.14	63	42.430	75	38.60	191
27.4	51.047	72	72.54	18	55.745	71	32.56	7	7.692	70	80.54	40	42.318	112	40.46	186
Nov. 6.3	50.957	90	72.20	34	55.655	90	32.44	12	7.602	90	80.70	16	42.178	140	42.18	172
16.3	50.852	105	71.73	47	55.551	104	32.15	29	7.497	105	80.65	5	42.015	163	43.70	152
26.3	50.739	113	71.16	57	55.438	113	31.71	44	7.381	116	80.39	26	41.840	175	44.93	123
Dec. 6.3	50.621	118	70.51	65	55.319	119	31.14	57	7.261	120	79.94	45	41.660	180	45.86	93
16.2	50.505	116	69.78	73	55.202	117	30.45	69	7.139	122	79.29	65	41.480	180	46.42	56
26.2	50.393	112	69.04	74	55.089	113	29.67	78	7.022	117	78.49	80	41.308	172	46.60	18
36.2	50.289	104	68.27	77	54.983	106	28.83	84	6.911	111	77.56	93	41.150	158	46.41	19
Mean Place	46.809		43.44		51.502		2.26		3.403		48.80		37.903		59.68	
Sec δ, Tan δ	1.000		+0.014		1.005		+0.104		1.024		+0.218		1.274		−0.789	
$D_\psi a$, $D_\omega a$	+0.06		0.00		+0.06		−0.01		+0.06		−0.01		+0.06		+0.05	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	**72 Pegasi** (*mean*). Mag. 5.2				**λ Andromedæ.** Mag. 4.0				**ι Andromedæ.** Mag. 4.3				**ι Piscium.** Mag. 4.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 23 29		° ′ +30 52		h m 23 33		° ′ +46 1		h m 23 34		° ′ +42 49		h m 23 35		° ′ + 5 11	
	s		″		s		″		s		″		s		″	
Jan. 1.2	56.544		57.46		36.358		29.36		10.224		29.76		47.682		21.15	
11.2	56.409	135	56.25	121	36.163	195	28.12	124	10.044	180	28.52	124	47.581	101	20.33	82
21.1	56.289	120	54.78	147	35.985	178	26.48	164	9.881	163	26.92	160	47.492	89	19.49	84
31.1	56.187	102	53.09	169	35.832	153	24.50	198	9.739	142	25.01	191	47.419	73	18.67	82
Feb. 10.1	56.111	76	51.28	181	35.712	120	22.27	223	9.629	110	22.85	216	47.365	54	17.94	73
20.1	56.065	46	49.41	187	35.631	81	19.89	238	9.555	74	20.57	228	47.334	31	17.29	65
Mar. 2.0	56.054	11 —	47.56	185	35.596	35 —	17.43	246	9.525	30 —	18.23	234	47.331	3 —	16.80	49
12.0	56.084	30	45.83	173	35.613	17	15.02	241	9.543	18	15.96	227	47.361	30	16.51	29
22.0	56.157	73	44.30	153	35.686	73	12.76	226	9.614	71	13.84	212	47.427	66	16.43	8 —
Apr. 1.0	56.275	118	43.03	127	35.816	130	10.75	201	9.739	125	11.97	187	47.529	102	16.62	19
10.9	56.440	165	42.09	94	36.004	188	9.05	170	9.918	179	10.44	153	47.669	140	17.07	45
20.9	56.647	207	41.54	55	36.245	241	7.77	128	10.149	231	9.30	114	47.849	180	17.83	76
30.9	56.895	248	41.40	14 —	36.536	291	6.93	84	10.428	279	8.60	70	48.064	215	18.85	102
May 10.8	57.178	283	41.69	29	36.867	331	6.58	35 —	10.746	318	8.38	22 —	48.311	247	20.16	131
20.8	57.490	312	42.40	71	37.234	367	6.72	14	11.097	351	8.65	27	48.585	274	21.69	153
30.8	57.822	332	43.52	112	37.625	391	7.37	65	11.471	374	9.39	74	48.879	294	23.43	174
June 9.8	58.166	344	45.03	151	38.029	404	8.49	112	11.857	386	10.60	121	49.188	309	25.32	189
19.7	58.513	347	46.86	183	38.434	405	10.07	158	12.247	390	12.24	164	49.501	313	27.32	200
29.7	58.854	341	48.99	213	38.831	397	12.05	198	12.629	382	14.26	202	49.811	310	29.37	205
July 9.7	59.178	324	51.34	235	39.209	378	14.37	232	12.993	364	16.59	233	50.108	297	31.42	205
19.7	59.479	301	53.88	254	39.559	350	16.99	262	13.330	337	19.21	262	50.389	281	33.42	200
29.6	59.749	270	56.52	264	39.873	314	19.83	284	13.633	303	22.03	282	50.643	254	35.32	190
Aug. 8.6	59.985	236	59.20	268	40.145	272	22.85	302	13.895	262	24.98	295	50.865	222	37.08	176
18.6	60.179	194	61.89	269	40.370	225	25.95	310	14.112	217	28.02	304	51.053	188	38.64	156
28.5	60.329	150	64.49	260	40.543	173	29.08	313	14.281	169	31.06	304	51.202	149	40.01	137
Sept. 7.5	60.436	107	66.99	250	40.665	122	32.18	310	14.400	119	34.05	299	51.311	109	41.14	113
17.5	60.499	63	69.33	234	40.736	71	35.17	299	14.471	71	36.93	288	51.381	70	42.05	91
27.5	60.520	21 —	71.47	214	40.756	20 —	38.01	284	14.494	23 —	39.66	273	51.412	31 —	42.72	67
Oct. 7.4	60.503	17	73.38	191	40.730	26	40.64	263	14.472	22	42.15	249	51.410	2	43.16	44
17.4	60.453	50	75.01	163	40.662	68	43.01	237	14.411	61	44.39	224	51.376	34	43.38	22
27.4	60.373	80	76.36	135	40.556	106	45.06	205	14.315	96	46.32	193	51.317	59	43.41	3 —
Nov. 6.4	60.268	105	77.38	102	40.419	137	46.76	170	14.188	127	47.90	158	51.236	81	43.24	17
16.3	60.145	123	78.07	69	40.255	164	48.06	130	14.037	151	49.09	119	51.141	95	42.92	32
26.3	60.007	138	78.41	34 —	40.071	184	48.92	86	13.866	171	49.86	77	51.034	107	42.46	46
Dec. 6.3	59.862	145	78.40	1	39.871	200	49.33	41 —	13.682	184	50.20	34 —	50.921	113	41.87	59
16.2	59.711	151	78.02	38	39.664	207	49.27	6	13.490	192	50.08	12	50.805	116	41.17	70
26.2	59.562	149	77.29	73	39.454	210	48.73	54	13.296	194	49.51	57	50.691	114	40.40	77
36.2	59.417	145	76.24	105	39.248	206	47.73	100	13.106	190	48.52	99	50.582	109	39.58	82
Mean Place	55.872		41.59		35.687		9.20		9.538		10.40		46.994		13.77	
Sec δ, Tan δ	1.165		+0.598		1.440		+1.036		1.363		+0.927		1.004		+0.091	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.06		−0.04		+0.06		−0.07		+0.06		−0.06		+0.06		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		−0.1		+0.4		−0.1		+0.4		−0.1		+0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cephei. Mag. 3.4				κ Andromedæ. Mag. 4.3				ω² Aquarii. Mag. 4.6				ι¹ Aquarii. Mag. 5.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 23 35		° ′ +77 10		h m 23 36		° ′ +43 53		h m 23 38		° ′ −14 59		h m 23 40		° ′ −18 43	
	s		″		s		″		s		″		s		″	
Jan. 1.2	60.90	85	74.94	90	25.535	185	26.60	122	31.996	106	33.45	33	0.740	110	36.70	22
11.2	60.05	79	74.04	147	25.350	169	25.38	159	31.890	94	33.78	13	0.630	98	36.92	1
21.2	59.26	70	72.57	200	25.181	147	23.79	191	31.796	77	33.91	— 5	0.532	81	36.93	— 24
31.1	58.56	57	70.57	246	25.034	116	21.88	216	31.719	57	33.86	28	0.451	60	36.69	46
Feb. 10.1	57.99	42	68.11	279	24.918	78	19.72	230	31.662	33	33.58	49	0.391	35	36.23	71
20.1	57.57	27	65.32	303	24.840	35	17.42	236	31.629	5	33.09	72	0.356	9	35.52	94
Mar. 2.0	57.30	8	62.29	313	24.805	— 15	15.06	232	31.624	— 26	32.37	95	0.347	— 25	34.58	118
12.0	57.22	— 10	59.16	312	24.820	68	12.74	215	31.650	62	31.42	118	0.372	60	33.40	140
22.0	57.32	28	56.04	295	24.888	123	10.59	193	31.712	99	30.24	139	0.432	97	32.00	161
Apr. 1.0	57.60	47	53.09	270	25.011	178	8.66	159	31.811	136	28.85	161	0.529	136	30.39	179
10.9	58.07	63	50.39	234	25.189	231	7.07	120	31.947	175	27.24	178	0.665	175	28.60	196
20.9	58.70	76	48.05	188	25.420	280	5.87	76	32.122	212	25.46	193	0.840	212	26.64	210
30.9	59.46	89	46.17	137	25.700	321	5.11	29	32.334	245	23.53	205	1.052	246	24.54	217
May 10.8	60.35	97	44.80	82	26.021	355	4.82	— 21	32.579	273	21.48	212	1.298	274	22.37	220
20.8	61.32	103	43.98	24	26.376	378	5.03	69	32.852	295	19.36	213	1.572	299	20.17	219
30.8	62.35	105	43.74	— 34	26.754	392	5.72	116	33.147	311	17.23	209	1.871	313	17.98	211
June 9.8	63.40	106	44.08	92	27.146	395	6.88	160	33.458	318	15.14	200	2.184	321	15.87	199
19.7	64.46	102	45.00	145	27.541	388	8.48	199	33.776	316	13.14	186	2.505	320	13.88	182
29.7	65.48	97	46.45	197	27.929	370	10.47	231	34.092	306	11.28	166	2.825	311	12.06	159
July 9.7	66.45	88	48.42	242	28.299	343	12.78	261	34.398	289	9.62	145	3.136	294	10.47	133
19.7	67.33	79	50.84	281	28.642	309	15.39	281	34.687	264	8.17	116	3.430	268	9.14	103
29.6	68.12	67	53.65	316	28.951	268	18.20	296	34.951	233	7.01	88	3.698	238	8.11	71
Aug. 8.6	68.79	55	56.81	343	29.219	223	21.16	306	35.184	196	6.13	58	3.936	201	7.40	39
18.6	69.34	40	60.24	361	29.442	174	24.22	306	35.380	157	5.55	27	4.137	160	7.01	6
28.5	69.74	26	63.85	373	29.616	123	27.28	302	35.537	114	5.28	— 2	4.297	117	6.95	— 23
Sept. 7.5	70.00	12	67.58	378	29.739	73	30.30	292	35.651	73	5.30	30	4.414	75	7.18	50
17.5	70.12	— 4	71.36	374	29.812	26	33.22	277	35.724	33	5.60	53	4.489	33	7.68	76
27.5	70.08	18	75.10	362	29.838	— 19	35.99	255	35.757	— 4	6.13	74	4.522	— 4	8.44	94
Oct. 7.4	69.90	31	78.72	342	29.819	60	38.54	230	35.753	38	6.87	88	4.518	40	9.38	107
17.4	69.59	45	82.14	315	29.759	96	40.84	198	35.715	67	7.75	97	4.478	69	10.45	116
27.4	69.14	57	85.29	281	29.663	128	42.82	163	35.648	88	8.72	103	4.409	91	11.61	118
Nov. 6.4	68.57	66	88.10	238	29.535	152	44.45	125	35.560	105	9.75	102	4.318	109	12.79	114
16.3	67.91	75	90.48	187	29.383	174	45.70	82	35.455	118	10.77	98	4.209	122	13.93	106
26.3	67.16	83	92.35	133	29.209	187	46.52	38	35.337	123	11.75	89	4.087	128	14.99	93
Dec. 6.3	66.33	87	93.68	74	29.022	195	46.90	— 7	35.214	124	12.64	76	3.959	129	15.92	76
16.2	65.46	89	94.42	11	28.827	198	46.83	53	35.090	122	13.40	63	3.830	127	16.68	59
26.2	64.57	87	94.53	— 53	28.629	195	46.30	96	34.968	114	14.03	46	3.703	118	17.27	39
36.2	63.70		94.00		28.434		45.34		34.854		14.49		3.585		17.66	
Mean Place	60.740		49.01		24.830		6.96		31.368		33.97		0.125		35.99	
Sec δ, Tan δ	4.509		+4.397		1.388		+0.962		1.035		−0.268		1.056		−0.339	
$D_\psi\alpha$, $D_\omega\alpha$	+0.05		−0.29		+0.06		−0.06		+0.06		+0.02		+0.06		+0.02	
, $D_\omega\delta$	+0.4		−0.1		+0.4		−0.1		+0.4		−0.1		+0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON

Washington Mean Time.	ε Tucanæ. Mag. 4.7				30 Piscium. Mag. 4.7				2 Ceti. Mag. 4.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m 23 55		° ′ −66 1		h m 23 57		° ′ −6 27		h m 23 59		° ′ −17 46	
	s		″		s		″		s		″	
Jan. 1.2	42.95	41	51.04	106	49.142	108	48.12	58	36.216	118	73.92	33
11.2	42.54	38	49.98	161	49.034	100	48.70	46	36.098	106	74.25	11
21.2	42.16	32	48.37	210	48.934	87	49.16	33	35.992	95	74.36	14
31.1	41.84	27	46.27	253	48.847	70	49.49	16	35.897	76	74.22	37
Feb. 10.1	41.57	21	43.74	288	48.777	49	49.65	0	35.821	55	73.85	62
20.1	41.36	13	40.86	319	48.728	23	49.65	22	35.766	27	73.23	86
Mar. 2.1	41.23	6	37.67	341	48.705	7	49.43	42	35.739	2	72.37	111
12.0	41.17	3	34.26	354	48.712	41	49.01	66	35.741	38	71.26	133
22.0	41.20	10	30.72	362	48.753	78	48.35	89	35.779	76	69.93	156
Apr. 1.0	41.30	18	27.10	360	48.831	117	47.46	114	35.855	116	68.37	176
10.9	41.48	28	23.50	349	48.948	156	46.32	135	35.971	155	66.61	193
20.9	41.76	34	20.01	335	49.104	194	44.97	157	36.126	194	64.68	209
30.9	42.10	41	16.66	310	49.298	228	43.40	175	36.320	229	62.59	218
May 10.9	42.51	48	13.56	280	49.526	259	41.65	189	36.549	262	60.41	223
20.8	42.99	53	10.76	243	49.785	283	39.76	200	36.811	287	58.18	223
30.8	43.52	57	8.33	200	50.068	301	37.76	205	37.098	307	55.95	218
June 9.8	44.09	60	6.33	153	50.369	310	35.71	204	37.405	317	53.77	206
19.8	44.69	60	4.80	101	50.679	312	33.67	200	37.722	320	51.71	191
29.7	45.29	60	3.79	47	50.991	304	31.67	188	38.042	315	49.80	169
July 9.7	45.89	58	3.32	6	51.295	290	29.79	173	38.357	299	48.11	144
19.7	46.47	54	3.38	61	51.585	268	28.06	153	38.656	279	46.67	114
29.6	47.01	48	3.99	113	51.853	240	26.53	130	38.935	249	45.53	83
Aug. 8.6	47.49	41	5.12	160	52.093	206	25.23	104	39.184	215	44.70	50
18.6	47.90	33	6.72	205	52.299	170	24.19	76	39.399	176	44.20	17
28.6	48.23	23	8.77	240	52.469	130	23.43	49	39.575	137	44.03	16
Sept. 7.5	48.46	14	11.17	267	52.599	92	22.94	22	39.712	95	44.19	43
17.5	48.60	4	13.84	283	52.691	53	22.72	3	39.807	53	44.62	71
27.5	48.64	5	16.67	289	52.744	16	22.75	26	39.860	15	45.33	92
Oct. 7.5	48.59	16	19.56	284	52.760	16	23.01	44	39.875	19	46.25	107
17.4	48.43	23	22.40	265	52.744	43	23.45	60	39.856	50	47.32	118
27.4	48.20	31	25.05	240	52.701	68	24.05	72	39.806	76	48.50	122
Nov. 6.4	47.89	37	27.45	201	52.633	86	24.77	78	39.730	96	49.72	120
16.3	47.52	41	29.46	155	52.547	100	25.55	82	39.634	110	50.92	113
26.3	47.11	44	31.01	103	52.447	109	26.37	82	39.524	122	52.05	102
Dec. 6.3	46.67	45	32.04	46	52.338	115	27.19	79	39.402	125	53.07	87
16.3	46.22	45	32.50	12	52.223	116	27.98	74	39.277	127	53.94	68
26.2	45.77	42	32.38	70	52.107	113	28.72	65	39.150	124	54.62	49
36.2	45.35		31.68		51.994		29.37		39.026		55.11	
Mean Place	43.016		38.95		48.368		51.19		35.489		73.16	
Sec δ, Tan δ	2.461		−2.249		1.006		−0.113		1.050		−0.321	
$D_\psi \alpha$, $D_\omega \alpha$	+0.06		+0.15		+0.06		+0.01		+0.06		+0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.4		0.0		+0.4		0.0		+0.4		0.0	

SUN, 1919.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Jan. 1	18 44 37.57	11.052	−23 3 8.6	+11.79	+ 3 25.29	+1.192	16 17.82	1 11.06	18 41 11.72
2	18 49 2.67	11.039	22 58 12.0	12.93	3 53.76	1.179	16 17.82	1 11.02	18 45 8.27
3	18 53 27.44	11.024	22 52 47.8	14.07	4 21.89	1.165	16 17.83	1 10.97	18 49 4.83
4	18 57 51.83	11.007	22 46 56.3	15.21	4 49.65	1.149	16 17.82	1 10.92	18 53 1.39
5	19 2 15.81	10.990	22 40 37.7	16 34	5 17.00	1.131	16 17.82	1 10.87	18 56 57.95
6	19 6 39.35	10.971	−22 33 52.2	+17.45	+ 5 43.91	+1.112	16 17.81	1 10.81	19 0 54.50
7	19 11 2.42	10.951	22 26 40.0	18.56	6 10.35	1.092	16 17.80	1 10.74	19 4 51.06
8	19 15 24.98	10.929	22 19 1.2	19.66	6 36.28	1.069	16 17.77	1 10.68	19 8 47.62
9	19 19 47.01	10.906	22 10 56.2	20.75	7 1.68	1.047	16 17.74	1 10.60	19 12 44.18
10	19 24 8.49	10.883	22 2 25.1	21.83	7 26.53	1.023	16 17.71	1 10.52	19 16 40.73
11	19 28 29.38	10.858	−21 53 28.3	+22.90	+ 7 50.79	+0.999	16 17.68	1 10.45	19 20 37.29
12	19 32 49.67	10.832	21 44 6.0	23.95	8 14.46	0.973	16 17.64	1 10.37	19 24 33.85
13	19 37 9.33	10.806	21 34 18.4	25.00	8 37.51	0.947	16 17.59	1 10.29	19 28 30.41
14	19 41 28.35	10.779	21 24 5.9	26.04	8 59.91	0.920	16 17.54	1 10.20	19 32 26.96
15	19 45 46.72	10.751	21 13 28.6	27.07	9 21.67	0.893	16 17.48	1 10.11	19 36 23.52
16	19 50 4.43	10.723	−21 2 26.9	+28.08	+ 9 42.76	+0.864	16 17.42	1 10.02	19 40 20.08
17	19 54 21.44	10.695	20 51 1.1	29.07	10 3.16	0.836	16 17.34	1 9.93	19 44 16.64
18	19 58 37.76	10.665	20 39 11.4	30.06	10 22.86	0.807	16 17.26	1 9.83	19 48 13.19
19	20 2 53.37	10.636	20 26 58.2	31.04	10 41.87	0.777	16 17.18	1 9.73	19 52 9.75
20	20 7 8.26	10.605	20 14 21.7	32.00	11 0.15	0.746	16 17.09	1 9.63	19 56 6.31
21	20 11 22.42	10.574	−20 1 22.5	+32.94	+11 17.70	+0.715	16 16.99	1 9.53	20 0 2.86
22	20 15 35.83	10.543	19 48 0.7	33.87	11 34.51	0.684	16 16.89	1 9.42	20 3 59.42
23	20 19 48.49	10.511	19 34 16.8	34.78	11 50.57	0.653	16 16.79	1 9.31	20 7 55.98
24	20 24 0.39	10.479	19 20 11.0	35.69	12 5.87	0.621	16 16.67	1 9.21	20 11 52.53
25	20 28 11.51	10.447	19 5 43.7	36.58	12 20.40	0.589	16 16.55	1 9.10	20 15 49.09
26	20 32 21.87	10.415	−18 50 55.5	+37.44	+12 34.15	+0.557	16 16.43	1 8.98	20 19 45.64
27	20 36 31.42	10.382	18 35 46.6	38.29	12 47.11	0.523	16 16.31	1 8.87	20 23 42.20
28	20 40 40.17	10.348	18 20 17.4	39.13	12 59.27	0.490	16 16.18	1 8.76	20 27 38.76
29	20 44 48.13	10.315	18 4 28.3	39.95	13 10.64	0.457	16 16.05	1 8.64	20 31 35.31
30	20 48 55.27	10.281	17 48 19.8	40.75	13 21.21	0.423	16 15.92	1 8.53	20 35 31.87
31	20 53 1.59	10.247	−17 31 52.1	+41.53	+13 30.95	+0.389	16 15.78	1 8.41	20 39 28.42
Feb. 1	20 57 7.10	10.213	17 15 5.9	42.30	13 39.88	0.355	16 15.64	1 8.30	20 43 24.98
2	21 1 11.78	10.178	16 58 1.4	43.06	13 47.97	0.320	16 15.50	1 8.18	20 47 21.54
3	21 5 15.63	10.143	16 40 39.1	43.79	13 55.24	0.286	16 15.35	1 8.07	20 51 18.09
4	21 9 18.64	10.109	16 22 59.5	44.50	14 1.69	0.252	16 15.19	1 7.95	20 55 14.65
5	21 13 20.82	10.074	−16 5 3.1	+45.20	+14 7.30	+0.217	16 15.04	1 7.84	20 59 11.20
6	21 17 22.16	10.039	15 46 50.1	45.88	14 12.08	0.182	16 14.89	1 7.73	21 3 7.76
7	21 21 22.68	10.005	15 28 20.9	46.54	14 16.03	0.148	16 14.73	1 7.61	21 7 4.31
8	21 25 22.37	9.970	15 9 36.2	47.19	14 19.15	0.114	16 14.56	1 7.50	21 11 0.87
9	21 29 21.25	9.936	14 50 36.2	47.81	14 21.47	0.080	16 14.39	1 7.39	21 14 57.42
10	21 33 19.30	9.903	−14 31 21.4	+48.42	+14 22.96	+0.046	16 14.21	1 7.28	21 18 53.98
11	21 37 16.56	9.869	14 11 52.1	49.02	14 23.67	+0.013	16 14.04	1 7.17	21 22 50.53
12	21 41 13.04	9.837	13 52 8.7	49.59	14 23.59	−0.020	16 13.86	1 7.06	21 26 47.08
13	21 45 8.73	9.806	13 32 11.8	50.15	14 22.73	0.052	16 13.67	1 6.95	21 30 43.64
14	21 49 3.67	9.773	13 12 1.5	50.69	14 21.12	0.083	16 13.48	1 6.84	21 34 40.19
15	21 52 57.86	9.743	−12 51 38.4	+51.22	+14 18.76	−0.113	16 13.29	1 6.74	21 38 36.75
16	21 56 51.32	9.713	−12 31 2.8	+51.74	+14 15.67	−0.143	16 13.08	1 6.63	21 42 33.30

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
		h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Feb.	16	21 56 51.32	9.713	−12 31 2.8	+51.74	+14 15.67	−0.143	16 13.08	1 6.63	21 42 33.30
	17	22 0 44.05	9.683	12 10 15.1	52.23	14 11.87	0.173	16 12.88	1 6.53	21 46 29.85
	18	22 4 36.09	9.654	11 49 15.7	52.71	14 7.37	0.202	16 12.67	1 6.43	21 50 26.41
	19	22 8 27.45	9.626	11 28 5.2	53.17	14 2.18	0.230	16 12.45	1 6.33	21 54 22.96
	20	22 12 18.14	9.598	11 6 43.7	53.61	13 56.33	0.258	16 12.23	1 6.23	21 58 19.52
	21	22 16 8.17	9.571	−10 45 11.8	+54.04	+13 49.82	−0.285	16 12.01	1 6.13	22 2 16.07
	22	22 19 57.57	9.545	10 23 29.8	54.45	13 42.69	0.311	16 11.78	1 6.04	22 6 12.62
	23	22 23 46.33	9.520	10 1 38.1	54.84	13 34.93	0.336	16 11.56	1 5.95	22 10 9.18
	24	22 27 34.50	9.495	9 39 37.2	55.22	13 26.56	0.361	16 11.32	1 5.86	22 14 5.73
	25	22 31 22.08	9.470	9 17 27.5	55.58	13 17.61	0.385	16 11.09	1 5.77	22 18 2.28
	26	22 35 9.08	9.447	− 8 55 9.4	+55.92	+13 8.09	−0.408	16 10.86	1 5.69	22 21 58.84
	27	22 38 55.53	9.424	8 32 43.2	56.25	12 58.01	0.431	16 10.62	1 5.60	22 25 55.39
	28	22 42 41.42	9.401	8 10 9.4	56.55	12 47.38	0.454	16 10.38	1 5.52	22 29 51.94
Mar.	1	22 46 26.80	9.380	7 47 28.5	56.84	12 36.23	0.475	16 10.14	1 5.45	22 33 48.50
	2	22 50 11.65	9.359	7 24 40.9	57.12	12 24.56	0.496	16 9.90	1 5.38	22 37 45.05
	3	22 53 56.00	9.338	− 7 1 47.0	+57.37	+12 12.39	−0.517	16 9.65	1 5.31	22 41 41.60
	4	22 57 39.86	9.318	6 38 47.1	57.61	11 59.74	0.537	16 9.41	1 5.24	22 45 38.16
	5	23 1 23.26	9.299	6 15 41.9	57.83	11 46.61	0.556	16 9.17	1 5.17	22 49 34.71
	6	23 5 6.19	9.280	5 52 31.6	58.03	11 33.03	0.575	16 8.92	1 5.11	22 53 31.26
	7	23 8 48.67	9.261	5 29 16.5	58.22	11 19.00	0.593	16 8.68	1 5.05	22 57 27.81
	8	23 12 30.73	9.244	− 5 5 57.2	+58.39	+11 4.55	−0.611	16 8.43	1 4.99	23 1 24.37
	9	23 16 12.39	9.228	4 42 34.1	58.54	10 49.69	0.627	16 8.18	1 4.93	23 5 20.92
	10	23 19 53.66	9.212	4 19 7.4	58.68	10 34.45	0.642	16 7.92	1 4.88	23 9 17.47
	11	23 23 34.56	9.197	3 55 37.5	58.80	10 18.84	0.657	16 7.67	1 4.83	23 13 14.02
	12	23 27 15.12	9.183	3 32 5.0	58.91	10 2.89	0.671	16 7.41	1 4.78	23 17 10.58
	13	23 30 55.36	9.170	− 3 8 30.0	+59.00	+ 9 46.63	−0.684	16 7.15	1 4.74	23 21 7.13
	14	23 34 35.30	9.159	2 44 52.9	59.08	9 30.07	0.695	16 6.89	1 4.70	23 25 3.68
	15	23 38 14.97	9.148	2 21 14.0	59.15	9 13.23	0.706	16 6.63	1 4.66	23 29 0.23
	16	23 41 54.39	9.138	1 57 33.8	59.20	8 56.14	0.717	16 6.36	1 4.62	23 32 56.79
	17	23 45 33.59	9.129	1 33 52.5	59.23	8 38.82	0.726	16 6.09	1 4.59	23 36 53.34
	18	23 49 12.57	9.121	− 1 10 10.6	+59.25	+ 8 21.31	−0.733	16 5.82	1 4.56	23 40 49.89
	19	23 52 51.39	9.114	0 46 28.3	59.26	8 3.62	0.740	16 5.55	1 4.54	23 44 46.44
	20	23 56 30.05	9.108	− 0 22 46.1	59.26	7 45.78	0.746	16 5.27	1 4.52	23 48 43.00
	21	0 0 8.57	9.103	+ 0 0 55.7	59.23	7 27.80	0.751	16 5.00	1 4.50	23 52 39.55
	22	0 3 46.99	9.099	0 24 36.8	59.19	7 9.71	0.756	16 4.72	1 4.48	23 56 36.10
	23	0 7 25.31	9.095	+ 0 48 16.9	+59.14	+ 6 51.53	−0.759	16 4.44	1 4.47	0 0 32.65
	24	0 11 3.57	9.093	1 11 55.4	59.07	6 33.29	0.761	16 4.16	1 4.45	0 4 29.20
	25	0 14 41.78	9.092	1 35 32.2	58.99	6 15.00	0.762	16 3.88	1 4.44	0 8 25.76
	26	0 18 19.98	9.091	1 59 6.8	58.89	5 56.69	0.763	16 3.60	1 4.44	0 12 22.31
	27	0 21 58.17	9.091	2 22 38.9	58.77	5 38.38	0.763	16 3.31	1 4.44	0 16 18.86
	28	0 25 36.37	9.092	+ 2 46 8.2	+58.65	+ 5 20.08	−0.762	16 3.03	1 4.44	0 20 15.41
	29	0 29 14.61	9.094	3 9 34.2	58.51	5 1.81	0.760	16 2.75	1 4.44	0 24 11.97
	30	0 32 52.89	9.097	3 32 56.5	58.35	4 43.59	0.757	16 2.47	1 4.45	0 28 8.52
	31	0 36 31.25	9.100	3 56 14.9	58.17	4 25.45	0.754	16 2.19	1 4.46	0 32 5.07
Apr.	1	0 40 9.68	9.103	4 19 28.8	57.98	4 7.38	0.751	16 1.92	1 4.47	0 36 1.62
	2	0 43 48.20	9.107	+ 4 42 37.9	+57.77	+ 3 49.40	−0.747	16 1.64	1 4.48	0 39 58.18
	3	0 47 26.82	9.112	+ 5 5 42.0	+57.55	+ 3 31.52	−0.742	16 1.37	1 4.50	0 43 54.73

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0^{s}.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Apr. 1	0 40 9.68	9.103	+ 4 19 28.8	+57.98	+4 7.38	−0.751	16 1.92	1 4.47	0 36 1.62
2	0 43 48.20	9.107	4 42 37.9	57.77	3 49.40	0.747	16 1.64	1 4.48	0 39 58.18
3	0 47 26.82	9.112	5 5 42.0	57.55	3 31.52	0.742	16 1.37	1 4.50	0 43 54.73
4	0 51 5.58	9.118	5 28 40.5	57.32	3 13.77	0.737	16 1.10	1 4.53	0 47 51.28
5	0 54 44.48	9.124	5 51 33.2	57.07	2 56.16	0.731	16 0.83	1 4.56	0 51 47.83
6	0 58 23.53	9.130	+ 6 14 19.8	+56.80	+2 38.71	−0.724	16 0.56	1 4.58	0 55 44.39
7	1 2 2.75	9.138	6 36 59.6	56.52	2 21.43	0.716	16 0.29	1 4.61	0 59 40.94
8	1 5 42.16	9.147	6 59 32.7	56.23	2 4.33	0.708	16 0.02	1 4.65	1 3 37.49
9	1 9 21.79	9.156	7 21 58.7	55.92	1 47.44	0.699	15 59.75	1 4.68	1 7 34.04
10	1 13 1.64	9.165	7 44 17.0	55.60	1 30.78	0.689	15 59.49	1 4.72	1 11 30.60
11	1 16 41.73	9.176	+ 8 6 27.5	+55.27	+1 14.38	−0.678	15 59.22	1 4.76	1 15 27.15
12	1 20 22.10	9.188	8 28 29.9	54.93	0 58.24	0.666	15 58.95	1 4.80	1 19 23.70
13	1 24 2.75	9.200	8 50 23.7	54.56	0 42.38	0.654	15 58.68	1 4.84	1 23 20.26
14	1 27 43.71	9.214	9 12 8.7	54.19	0 26.83	0.641	15 58.42	1 4.89	1 27 16.81
15	1 31 25.00	9.227	9 33 44.6	53.79	+0 11.60	0.627	15 58.15	1 4.94	1 31 13.36
16	1 35 6.63	9.242	+ 9 55 10.9	+53.39	−0 3.27	−0.613	15 57.88	1 4.99	1 35 9.92
17	1 38 48.63	9.258	10 16 27.6	52.98	0 17.79	0.597	15 57.61	1 5.04	1 39 6.47
18	1 42 31.01	9.274	10 37 34.2	52.56	0 31.93	0.580	15 57.35	1 5.10	1 43 3.02
19	1 46 13.79	9.291	10 58 30.3	52.12	0 45.66	0.563	15 57.08	1 5.16	1 46 59.58
20	1 49 56.98	9.309	11 19 15.7	51.66	0 58.99	0.546	15 56.81	1 5.22	1 50 56.13
21	1 53 40.60	9.327	+11 39 49.9	+51.19	−1 11.89	−0.528	15 56.55	1 5.28	1 54 52.68
22	1 57 24.67	9.346	12 0 12.8	50.71	1 24.34	0.509	15 56.28	1 5.34	1 58 49.24
23	2 1 9.21	9.365	12 20 23.9	50.21	1 36.33	0.490	15 56.02	1 5.41	2 2 45.79
24	2 4 54.21	9.385	12 40 23.0	49.70	1 47.84	0.470	15 55.76	1 5.47	2 6 42.34
25	2 8 39.71	9.406	13 0 9.6	49.18	1 58.87	0.450	15 55.51	1 5.54	2 10 38.90
26	2 12 25.70	9.427	+13 19 43.6	+48.64	−2 9.40	−0.428	15 55.26	1 5.61	2 14 35.45
27	2 16 12.20	9.448	13 39 4.5	48.09	2 19.42	0.407	15 55.00	1 5.68	2 18 32.01
28	2 19 59.22	9.470	13 58 11.9	47.53	2 28.93	0.386	15 54.75	1 5.76	2 22 28.56
29	2 23 46.75	9.491	14 17 5.6	46.94	2 37.93	0.364	15 54.51	1 5.84	2 26 25.11
30	2 27 34.80	9.513	14 35 45.1	46.34	2 46.41	0.342	15 54.26	1 5.91	2 30 21.67
May 1	2 31 23.38	9.535	+14 54 10.2	+45.74	−2 54.37	−0.320	15 54.02	1 5.99	2 34 18.22
2	2 35 12.49	9.557	15 12 20.5	45.12	3 1.79	0.298	15 53.79	1 6.07	2 38 14.78
3	2 39 2.12	9.579	15 30 15.8	44.48	3 8.69	0.276	15 53.56	1 6.15	2 42 11.33
4	2 42 52.29	9.602	15 47 55.5	43.83	3 15.06	0.254	15 53.33	1 6.23	2 46 7.89
5	2 46 42.99	9.624	16 5 19.6	43.17	3 20.89	0.232	15 53.10	1 6.31	2 50 4.44
6	2 50 34.24	9.647	+16 22 27.7	+42.49	−3 26.19	−0.209	15 52.88	1 6.39	2 54 1.00
7	2 54 26.03	9.670	16 39 19.3	41.80	3 30.94	0.186	15 52.66	1 6.47	2 57 57.55
8	2 58 18.37	9.692	16 55 54.4	41.11	3 35.15	0.164	15 52.45	1 6.55	3 1 54.11
9	3 2 11.26	9.715	17 12 12.4	40.39	3 38.80	0.141	15 52.24	1 6.64	3 5 50.66
10	3 6 4.71	9.739	17 28 13.2	39.66	3 41.90	0.117	15 52.03	1 6.72	3 9 47.22
11	3 9 58.72	9.762	+17 43 56.5	+38.93	−3 44.44	−0.094	15 51.82	1 6.80	3 13 43.77
12	3 13 53.30	9.786	17 59 22.1	38.19	3 46.40	0.070	15 51.61	1 6.88	3 17 40.33
13	3 17 48.44	9.809	18 14 29.5	37.43	3 47.81	0.047	15 51.41	1 6.97	3 21 36.88
14	3 21 44.16	9.833	18 29 18.5	36.65	3 48.65	−0.023	15 51.20	1 7.05	3 25 33.44
15	3 25 40.45	9.857	18 43 49.0	35.87	3 48.92	+0.001	15 51.00	1 7.13	3 29 29.99
16	3 29 37.31	9.881	+18 58 0.6	+35.08	−3 48.61	+0.025	15 50.80	1 7.21	3 33 26.55
17	3 33 34.75	9.905	+19 11 52.9	+34.27	−3 47.73	+0.049	15 50.60	1 7.29	3 37 23.11

Note.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
		h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
May	17	3 33 34.75	9.905	+19 11 52.9	+34.27	−3 47.73	+0.049	15 50.60	1 7.29	3 37 23.11
	18	3 37 32.76	9.929	19 25 25.7	33.45	3 46.28	0.072	15 50.40	1 7.37	3 41 19.66
	19	3 41 31.34	9.953	19 38 38.9	32.63	3 44.26	0.096	15 50.21	1 7.45	3 45 16.22
	20	3 45 30.49	9.976	19 51 32.1	31.80	3 41.67	0.120	15 50.02	1 7.53	3 49 12.77
	21	3 49 30.21	10.000	20 4 5.0	30.95	3 38.52	0.143	15 49.83	1 7.60	3 53 9.33
	22	3 53 30.49	10.023	+20 16 17.5	+30.08	−3 34.80	+0.166	15 49.64	1 7.68	3 57 5.88
	23	3 57 31.33	10.046	20 28 9.3	29.21	3 30.53	0.189	15 49.46	1 7.75	4 1 2.44
	24	4 1 32.72	10.069	20 39 40.0	28.34	3 25.71	0.212	15 49.28	1 7.82	4 4 59.00
	25	4 5 34.63	10.091	20 50 49.4	27.45	3 20.37	0.234	15 49.11	1 7.89	4 8 55.55
	26	4 9 37.07	10.112	21 1 37.4	26.55	3 14.50	0.255	15 48.94	1 7.96	4 12 52.11
	27	4 13 40.03	10.133	+21 12 3.6	+25.64	−3 8.12	+0.276	15 48.78	1 8.03	4 16 48.67
	28	4 17 43.47	10.153	21 22 7.9	24.72	3 1.25	0.296	15 48.62	1 8.09	4 20 45.22
	29	4 21 47.40	10.173	21 31 50.1	23.79	2 53.90	0.315	15 48.47	1 8.16	4 24 41.78
	30	4 25 51.78	10.192	21 41 9.9	22.85	2 46.10	0.334	15 48.32	1 8.22	4 28 38.34
	31	4 29 56.59	10.209	21 50 7.1	21.91	2 37.87	0.352	15 48.18	1 8.28	4 32 34.89
June	1	4 34 1.82	10.226	+21 58 41.5	+20.95	−2 29.21	+0.368	15 48.04	1 8.34	4 36 31.45
	2	4 38 7.45	10.242	22 6 52.9	19.99	2 20.17	0.384	15 47.90	1 8.40	4 40 28.01
	3	4 42 13.45	10.257	22 14 41.3	19.03	2 10.75	0.400	15 47.77	1 8.46	4 44 24.56
	4	4 46 19.81	10.272	22 22 6.4	18.05	2 0.98	0.414	15 47.65	1 8.51	4 48 21.12
	5	4 50 26.51	10.286	22 29 7.9	17.07	1 50.87	0.428	15 47.53	1 8.56	4 52 17.68
	6	4 54 33.54	10.299	+22 35 45.9	+16.09	−1 40.43	+0.442	15 47.41	1 8.61	4 56 14.23
	7	4 58 40.86	10.311	22 42 0.2	15.10	1 29.69	0.454	15 47.30	1 8.65	5 0 10.79
	8	5 2 48.47	10.322	22 47 50.6	14.10	1 18.66	0.465	15 47.19	1 8.69	5 4 7.35
	9	5 6 56.35	10.333	22 53 16.9	13.10	1 7.36	0.476	15 47.09	1 8.73	5 8 3.90
	10	5 11 4.49	10.344	22 58 19.2	12.09	0 55.82	0.486	15 46.98	1 8.77	5 12 0.46
	11	5 15 12.86	10.353	+23 2 57.3	+11.08	−0 44.04	+0.495	15 46.88	1 8.80	5 15 57.02
	12	5 19 21.44	10.362	23 7 10.9	10.06	0 32.06	0.504	15 46.79	1 8.83	5 19 53.58
	13	5 23 30.21	10.369	23 11 0.3	9.04	0 19.87	0.511	15 46.69	1 8.85	5 23 50.13
	14	5 27 39.17	10.376	23 14 25.1	8.02	−0 7.51	0.518	15 46.60	1 8.87	5 27 46.69
	15	5 31 48.27	10.382	23 17 25.3	7.00	+0 5.01	0.524	15 46.51	1 8.89	5 31 43.25
	16	5 35 57.52	10.388	+23 20 0.9	+ 5.97	+0 17.67	+0.530	15 46.43	1 8.91	5 35 39.81
	17	5 40 6.89	10.393	23 22 11.8	4.94	0 30.44	0.534	15 46.35	1 8.92	5 39 36.36
	18	5 44 16.36	10.396	23 23 58.0	3.91	0 43.31	0.538	15 46.28	1 8.93	5 43 32.92
	19	5 48 25.91	10.400	23 25 19.3	2.87	0 56.27	0.541	15 46.21	1 8.94	5 47 29.48
	20	5 52 35.52	10.401	23 26 15.9	1.84	1 9.29	0.543	15 46.14	1 8.94	5 51 26.04
	21	5 56 45.15	10.402	+23 26 47.7	+ 0.81	+1 22.34	+0.544	15 46.07	1 8.94	5 55 22.59
	22	6 0 54.80	10.402	23 26 54.5	− 0.23	1 35.39	0.544	15 46.01	1 8.94	5 59 19.15
	23	6 5 4.44	10.401	23 26 36.4	1.27	1 48.45	0.543	15 45.95	1 8.94	6 3 15.71
	24	6 9 14.05	10.398	23 25 53.6	2.30	2 1.46	0.540	15 45.90	1 8.93	6 7 12.27
	25	6 13 23.59	10.395	23 24 46.0	3.33	2 14.40	0.537	15 45.85	1 8.91	6 11 8.82
	26	6 17 33.04	10.391	+23 23 13.7	− 4.36	+2 27.25	+0.533	15 45.81	1 8.90	6 15 5.38
	27	6 21 42.36	10.386	23 21 16.7	5.39	2 39.98	0.528	15 45.78	1 8.88	6 19 1.94
	28	6 25 51.53	10.379	23 18 55.0	6.42	2 52.57	0.521	15 45.75	1 8.85	6 22 58.50
	29	6 30 0.53	10.370	23 16 8.7	7.44	3 4.98	0.512	15 45.73	1 8.82	6 26 55.05
	30	6 34 9.32	10.361	23 12 58.0	8.46	3 17.17	0.503	15 45.71	1 8.79	6 30 51.61
July	1	6 38 17.88	10.351	+23 9 22.8	− 9.47	+3 29.13	+0.493	15 45.70	1 8.76	6 34 48.17
	2	6 42 26.17	10.339	+23 5 23.4	−10.48	+3 40.84	+0.482	15 45.69	1 8.73	6 38 44.72

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
July 1	6 38 17.88	10.351	+23 9 22.8	− 9.47	+3 29.13	+0.493	15 45.70	1 8.76	6 34 48.17
2	6 42 26.17	10.339	23 5 23.4	10.48	3 40.84	0.482	15 45.69	1 8.73	6 38 44.72
3	6 46 34.19	10.327	23 0 59.8	11.48	3 52.27	0.470	15 45.69	1 8.69	6 42 41.28
4	6 50 41.90	10.314	22 56 12.2	12.48	4 3.40	0.457	15 45.69	1 8.65	6 46 37.84
5	6 54 49.29	10.301	22 51 0.6	13.48	4 14.20	0.443	15 45.70	1 8.61	6 50 34.40
6	6 58 56.32	10.286	+22 45 25.1	−14.47	+4 24.65	+0.428	15 45.71	1 8.56	6 54 30.95
7	7 3 3.00	10.271	22 39 26.0	15.45	4 34.75	0.413	15 45.73	1 8.51	6 58 27.51
8	7 7 9.31	10.254	22 33 3.4	16.43	4 44.46	0.397	15 45.76	1 8.46	7 2 24.07
9	7 11 15.22	10.237	22 26 17.4	17.40	4 53.79	0.380	15 45.79	1 8.41	7 6 20.62
10	7 15 20.71	10.220	22 19 8.2	18.37	5 2.70	0.362	15 45.81	1 8.35	7 10 17.18
11	7 19 25.78	10.202	+22 11 35.8	−19.32	+5 11.18	+0.344	15 45.84	1 8.29	7 14 13.74
12	7 23 30.40	10.183	22 3 40.6	20.27	5 19.22	0.326	15 45.88	1 8.23	7 18 10.29
13	7 27 34.57	10.164	21 55 22.7	21.22	5 26.83	0.307	15 45.91	1 8.17	7 22 6.85
14	7 31 38.28	10.145	21 46 42.2	22.15	5 33.95	0.287	15 45.95	1 8.10	7 26 3.41
15	7 35 41.51	10.125	21 37 39.3	23.08	5 40.61	0.268	15 46.00	1 8.03	7 29 59.96
16	7 39 44.27	10.105	+21 28 14.3	−24.00	+5 46.79	+0.247	15 46.04	1 7.96	7 33 56.52
17	7 43 46.52	10.084	21 18 27.3	24.91	5 52.48	0.227	15 46.09	1 7.89	7 37 53.08
18	7 47 48.27	10.063	21 8 18.6	25.81	5 57.66	0.206	15 46.15	1 7.82	7 41 49.63
19	7 51 49.51	10.041	20 57 48.1	26.71	6 2.33	0.184	15 46.21	1 7.74	7 45 46.19
20	7 55 50.24	10.019	20 46 56.5	27.59	6 6.49	0.162	15 46.27	1 7.66	7 49 42.75
21	7 59 50.44	9.997	+20 35 43.8	−28.47	+6 10.11	+0.140	15 46.33	1 7.58	7 53 39.30
22	8 3 50.09	9.974	20 24 10.1	29.33	6 13.20	0.117	15 46.41	1 7.50	7 57 35.86
23	8 7 49.19	9.951	20 12 16.0	30.18	6 15.74	0.094	15 46.49	1 7.42	8 1 32.42
24	8 11 47.73	9.927	20 0 1.5	31.02	6 17.72	0.071	15 46.57	1 7.33	8 5 28.97
25	8 15 45.70	9.904	19 47 26.9	31.86	6 19.13	0.047	15 46.65	1 7.25	8 9 25.53
26	8 19 43.09	9.879	+19 34 32.5	−32.67	+6 19.97	+0.023	15 46.74	1 7.17	8 13 22.08
27	8 23 39.88	9.854	19 21 18.6	33.48	6 20.20	−0.002	15 46.84	1 7.08	8 17 18.64
28	8 27 36.08	9.829	19 7 45.6	34.27	6 19.84	0.027	15 46.94	1 7.00	8 21 15.20
29	8 31 31.67	9.803	18 53 53.6	35.06	6 18.88	0.053	15 47.05	1 6.91	8 25 11.75
30	8 35 26.64	9.777	18 39 43.0	35.82	6 17.30	0.079	15 47.17	1 6.83	8 29 8.31
31	8 39 20.99	9.751	+18 25 14.1	−36.58	+6 15.11	−0.105	15 47.29	1 6.74	8 33 4.86
Aug. 1	8 43 14.73	9.725	18 10 27.1	37.33	6 12.29	0.131	15 47.41	1 6.65	8 37 1.42
2	8 47 7.84	9.699	17 55 22.4	38.06	6 8.85	0.157	15 47.54	1 6.57	8 40 57.97
3	8 51 0.32	9.674	17 40 0.2	38.78	6 4.79	0.182	15 47.67	1 6.48	8 44 54.53
4	8 54 52.18	9.648	17 24 20.9	39.49	6 0.11	0.208	15 47.81	1 6.39	8 48 51.08
5	8 58 43.42	9.622	+17 8 24.6	−40.19	+5 54.80	−0.234	15 47.95	1 6.31	8 52 47.64
6	9 2 34.04	9.596	16 52 11.8	40.87	5 48.89	0.259	15 48.09	1 6.22	8 56 44.19
7	9 6 24.05	9.571	16 35 42.7	41.54	5 42.36	0.284	15 48.24	1 6.14	9 0 40.75
8	9 10 13.45	9.546	16 18 57.5	42.21	5 35.22	0.309	15 48.39	1 6.05	9 4 37.30
9	9 14 2.24	9.521	16 1 56.7	42.86	5 27.49	0.334	15 48.54	1 5.96	9 8 33.86
10	9 17 50.45	9.497	+15 44 40.5	−43.49	+5 19.17	−0.359	15 48.70	1 5.88	9 12 30.41
11	9 21 38.08	9.473	15 27 9.0	44.12	5 10.27	0.383	15 48.85	1 5.80	9 16 26.97
12	9 25 25.14	9.449	15 9 22.8	44.73	5 0.80	0.406	15 49.01	1 5.72	9 20 23.52
13	9 29 11.64	9.426	14 51 22.0	45.33	4 50.77	0.429	15 49.18	1 5.63	9 24 20.08
14	9 32 57.58	9.403	14 33 6.9	45.91	4 40.19	0.452	15 49.35	1 5.55	9 28 16.63
15	9 36 43.00	9.382	+14 14 37.8	−46.49	+4 29.09	−0.474	15 49.52	1 5.47	9 32 13.18
16	9 40 27.90	9.360	+13 55 55.0	−47.06	+4 17.46	−0.495	15 49.69	1 5.40	9 36 9.74

Note.—For mean time interval of semidiameter passing meridian, subtract 0^{s}.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
		h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Aug.	16	9 40 27.90	9.360	+13 55 55.0	−47.06	+ 4 17.46	−0.495	15 49.69	1 5.40	9 36 9.74
	17	9 44 12.28	9.339	13 36 58.9	47.62	4 5.32	0.516	15 49.86	1 5.32	9 40 6.29
	18	9 47 56.17	9.319	13 17 49.6	48.15	3 52.67	0.536	15 50.03	1 5.25	9 44 2.85
	19	9 51 39.56	9.299	12 58 27.6	48.67	3 39.56	0.556	15 50.21	1 5.18	9 47 59.40
	20	9 55 22.48	9.279	12 38 53.2	49.19	3 25.97	0.576	15 50.40	1 5.11	9 51 55.95
	21	9 59 4.95	9.260	+12 19 6.6	−49.68	+ 3 11.91	−0.595	15 50.58	1 5.04	9 55 52.51
	22	10 2 46.94	9.241	11 59 8.3	50.16	2 57.40	0.614	15 50.77	1 4.97	9 59 49.06
	23	10 6 28.49	9.222	11 38 58.6	50.64	2 42.43	0.633	15 50.97	1 4.90	10 3 45.61
	24	10 10 9.61	9.204	11 18 37.7	51.09	2 27.04	0.650	15 51.17	1 4.83	10 7 42.17
	25	10 13 50.30	9.186	10 58 6.2	51.53	2 11.22	0.668	15 51.37	1 4.77	10 11 38.72
	26	10 17 30.57	9.169	+10 37 24.2	−51.96	+ 1 54.98	−0.685	15 51.58	1 4.71	10 15 35.27
	27	10 21 10.43	9.153	10 16 32.2	52.37	1 38.34	0.702	15 51.79	1 4.65	10 19 31.83
	28	10 24 49.91	9.137	9 55 30.4	52.78	1 21.30	0.718	15 52.01	1 4.60	10 23 28.38
	29	10 28 28.99	9.121	9 34 19.2	53.16	1 3.88	0.733	15 52.23	1 4.54	10 27 24.93
	30	10 32 7.71	9.106	9 12 58.9	53.53	0 46.09	0.748	15 52.46	1 4.49	10 31 21.49
	31	10 35 46.07	9.091	+ 8 51 29.9	−53.88	+ 0 27.96	−0.763	15 52.69	1 4.44	10 35 18.04
Sept.	1	10 39 24.09	9.077	8 29 52.6	54.22	+ 0 9.48	0.777	15 52.92	1 4.39	10 39 14.59
	2	10 43 1.80	9.064	8 8 7.1	54.56	− 0 9.33	0.790	15 53.15	1 4.35	10 43 11.15
	3	10 46 39.18	9.052	7 46 13.8	54.88	0 28.44	0.802	15 53.39	1 4.31	10 47 7.70
	4	10 50 16.28	9.041	7 24 13.2	55.17	0 47.83	0.813	15 53.62	1 4.27	10 51 4.25
	5	10 53 53.12	9.030	+ 7 2 5.4	−55.47	− 1 7.50	−0.824	15 53.86	1 4.23	10 55 0.80
	6	10 57 29.69	9.019	6 39 50.7	55.75	1 27.43	0.835	15 54.11	1 4.20	10 58 57.36
	7	11 1 6.04	9.010	6 17 29.7	56.01	1 47.58	0.844	15 54.35	1 4.16	11 2 53.91
	8	11 4 42.16	9.001	5 55 2.3	56.26	2 7.95	0.853	15 54.59	1 4.14	11 6 50.46
	9	11 8 18.10	8.994	5 32 29.0	56.50	2 28.51	0.860	15 54.84	1 4.12	11 10 47.02
	10	11 11 53.87	8.988	+ 5 9 50.3	−56.73	− 2 49.23	−0.866	15 55.09	1 4.10	11 14 43.57
	11	11 15 29.50	8.982	4 47 6.1	56.94	3 10.10	0.872	15 55.33	1 4.07	11 18 40.12
	12	11 19 5.01	8.977	4 24 17.1	57.14	3 31.08	0.877	15 55.58	1 4.06	11 22 36.67
	13	11 22 40.42	8.974	4 1 23.4	57.33	3 52.17	0.880	15 55.83	1 4.04	11 26 33.22
	14	11 26 15.75	8.972	3 38 25.1	57.51	4 13.32	0.882	15 56.08	1 4.03	11 30 29.78
	15	11 29 51.04	8.970	+ 3 15 22.9	−57.67	− 4 34.53	−0.884	15 56.33	1 4.02	11 34 26.33
	16	11 33 26.30	8.969	2 52 17.0	57.82	4 55.77	0.885	15 56.58	1 4.01	11 38 22.88
	17	11 37 1.55	8.969	2 29 7.6	57.96	5 17.02	0.885	15 56.84	1 4.01	11 42 19.43
	18	11 40 36.80	8.969	2 5 55.3	58.08	5 38.26	0.885	15 57.09	1 4.01	11 46 15.99
	19	11 44 12.09	8.971	1 42 40.2	58.18	5 59.47	0.883	15 57.35	1 4.01	11 50 12.54
	20	11 47 47.42	8.974	+ 1 19 22.8	−58.27	− 6 20.63	−0.880	15 57.61	1 4.01	11 54 9.09
	21	11 51 22.82	8.977	0 56 3.3	58.34	6 41.72	0.877	15 57.87	1 4.02	11 58 5.64
	22	11 54 58.30	8.981	0 32 42.3	58.40	7 2.73	0.873	15 58.14	1 4.03	12 2 2.20
	23	11 58 33.88	8.985	+ 0 9 19.9	58.45	7 23.65	0.869	15 58.40	1 4.05	12 5 58.75
	24	12 2 9.58	8.990	− 0 14 3.4	58.48	7 44.45	0.864	15 58.67	1 4.07	12 9 55.30
	25	12 5 45.41	8.996	− 0 37 27.2	−58.50	− 8 5.12	−0.858	15 58.94	1 4.09	12 13 51.85
	26	12 9 21.38	9.002	1 0 51.2	58.50	8 25.64	0.852	15 59.21	1 4.12	12 17 48.40
	27	12 12 57.52	9.010	1 24 15.0	58.48	8 45.99	0.844	15 59.49	1 4.15	12 21 44.96
	28	12 16 33.85	9.018	1 47 38.2	58.45	9 6.16	0.836	15 59.77	1 4.18	12 25 41.51
	29	12 20 10.38	9.027	2 11 0.6	58.41	9 26.12	0.827	16 0.05	1 4.21	12 29 38.06
	30	12 23 47.14	9.036	− 2 34 21.8	−58.35	− 9 45.87	−0.818	16 0.33	1 4.25	12 33 34.61
Oct.	1	12 27 24.14	9.047	− 2 57 41.4	−58.27	−10 5.38	−0.807	16 0.61	1 4.29	12 37 31.17

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{\mathrm{s}}.18$ from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
		h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Oct.	1	12 27 24.14	9.047	− 2 57 41.4	−58.27	−10 5.38	−0.807	16 0.61	1 4.29	12 37 31.17
	2	12 31 1.40	9.059	3 20 59.1	58.19	10 24.62	0.795	16 0.89	1 4.33	12 41 27.72
	3	12 34 38.94	9.071	3 44 14.5	58.09	10 43.57	0.783	16 1.17	1 4.37	12 45 24.27
	4	12 38 16.77	9.083	4 7 27.3	57.97	11 2.24	0.771	16 1.45	1 4.42	12 49 20.82
	5	12 41 54.93	9.097	4 30 37.0	57.84	11 20.58	0.757	16 1.74	1 4.48	12 53 17.37
	6	12 45 33.44	9.112	− 4 53 43.5	−57.69	−11 38.57	−0.743	16 2.02	1 4.53	12 57 13.93
	7	12 49 12.31	9.128	5 16 46.1	57.52	11 56.21	0.727	16 2.30	1 4.59	13 1 10.48
	8	12 52 51.57	9.145	5 39 44.8	57.35	12 13.46	0.710	16 2.57	1 4.65	13 5 7.03
	9	12 56 31.24	9.162	6 2 39.2	57.17	12 30.29	0.692	16 2.85	1 4.71	13 9 3.58
	10	13 0 11.35	9.181	6 25 28.9	56.97	12 46.68	0.674	16 3.13	1 4.77	13 13 0.14
	11	13 3 51.92	9.200	− 6 48 13.4	−56.74	−13 2.62	−0.654	16 3.40	1 4.84	13 16 56.69
	12	13 7 32.98	9.221	7 10 52.7	56.51	13 18.07	0.633	16 3.68	1 4.91	13 20 53.24
	13	13 11 14.55	9.243	7 33 26.1	56.26	13 33.02	0.611	16 3.95	1 4.99	13 24 49.80
	14	13 14 56.64	9.266	7 55 53.5	56.00	13 47.44	0.589	16 4.22	1 5.07	13 28 46.35
	15	13 18 39.29	9.289	8 18 14.4	55.73	14 1.30	0.566	16 4.48	1 5.15	13 32 42.90
	16	13 22 22.52	9.313	− 8 40 28.3	−55.43	−14 14.60	−0.542	16 4.75	1 5.23	13 36 39.45
	17	13 26 6.33	9.338	9 2 35.0	55.12	14 27.31	0.517	16 5.02	1 5.31	13 40 36.01
	18	13 29 50.74	9.364	9 24 33.9	54.79	14 39.42	0.491	16 5.29	1 5.40	13 44 32.56
	19	13 33 35.77	9.390	9 46 24.8	54.45	14 50.91	0.465	16 5.55	1 5.49	13 48 29.11
	20	13 37 21.43	9.416	10 8 7.2	54.09	15 1.77	0.439	16 5.82	1 5.58	13 52 25.67
	21	13 41 7.74	9.443	−10 29 40.8	−53.71	−15 11.98	−0.412	16 6.09	1 5.67	13 56 22.22
	22	13 44 54.71	9.471	10 51 5.1	53.31	15 21.53	0.384	16 6.35	1 5.77	14 0 18.77
	23	13 48 42.36	9.500	11 12 19.7	52.90	15 30.41	0.356	16 6.62	1 5.86	14 4 15.33
	24	13 52 30.70	9.528	11 33 24.2	52.47	15 38.62	0.327	16 6.88	1 5.96	14 8 11.88
	25	13 56 19.73	9.557	11 54 18.1	52.02	15 46.12	0.298	16 7.15	1 6.07	14 12 8.43
	26	14 0 9.46	9.587	−12 15 1.1	−51.56	−15 52.92	−0.269	16 7.42	1 6.17	14 16 4.99
	27	14 3 59.90	9.617	12 35 32.8	51.08	15 59.00	0.239	16 7.68	1 6.27	14 20 1.54
	28	14 7 51.08	9.648	12 55 52.7	50.58	16 4.37	0.208	16 7.95	1 6.38	14 23 58.09
	29	14 11 43.00	9.679	13 16 0.5	50.06	16 8.99	0.177	16 8.21	1 6.49	14 27 54.65
	30	14 15 35.67	9.711	13 35 55.8	49.53	16 12.87	0.146	16 8.47	1 6.60	14 31 51.20
	31	14 19 29.09	9.742	−13 55 38.0	−48.98	−16 15.99	−0.114	16 8.73	1 6.72	14 35 47.76
Nov.	1	14 23 23.28	9.774	14 15 7.0	48.41	16 18.35	0.082	16 8.99	1 6.83	14 39 44.31
	2	14 27 18.25	9.807	14 34 22.1	47.83	16 19.93	0.050	16 9.25	1 6.94	14 43 40.86
	3	14 31 14.00	9.839	14 53 23.0	47.24	16 20.73	−0.017	16 9.50	1 7.06	14 47 37.42
	4	14 35 10.54	9.873	15 12 9.4	46.62	16 20.74	+0.016	16 9.74	1 7.18	14 51 33.97
	5	14 39 7.89	9.906	−15 30 40.8	−45.98	−16 19.95	+0.050	16 9.99	1 7.30	14 55 30.53
	6	14 43 6.05	9.940	15 48 56.9	45.34	16 18.35	0.084	16 10.24	1 7.41	14 59 27.08
	7	14 47 5.04	9.975	16 6 57.2	44.68	16 15.92	0.118	16 10.48	1 7.53	15 3 23.64
	8	14 51 4.87	10.011	16 24 41.3	43.99	16 12.65	0.153	16 10.71	1 7.65	15 7 20.19
	9	14 55 5.56	10.046	16 42 8.9	43.30	16 8.54	0.189	16 10.95	1 7.77	15 11 16.75
	10	14 59 7.09	10.082	−16 59 19.7	−42.59	−16 3.58	+0.225	16 11.18	1 7.89	15 15 13.30
	11	15 3 9.48	10.118	17 16 13.1	41.85	15 57.75	0.261	16 11.40	1 8.01	15 19 9.86
	12	15 7 12.75	10.154	17 32 48.8	41.11	15 51.06	0.297	16 11.62	1 8.13	15 23 6.41
	13	15 11 16.89	10.191	17 49 6.4	40.35	15 43.50	0.333	16 11.83	1 8.25	15 27 2.97
	14	15 15 21.89	10.227	18 5 5.5	39.57	15 35.07	0.370	16 12.04	1 8.37	15 30 59.52
	15	15 19 27.77	10.263	−18 20 45.8	−38.78	−15 25.77	+0.406	16 12.25	1 8.48	15 34 56.08
	16	15 23 34.53	10.299	−18 36 6.7	−37.96	−15 15.60	+0.442	16 12.46	1 8.60	15 38 52.63

Note.—For mean time interval of semidiameter passing meridian, subtract 0^{s}.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi-diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
		h m s	s	° ′ ″	″	m s	s	′ ″	m s	h m s
Nov.	16	15 23 34.53	10.299	−18 36 6.7	−37.96	−15 15.60	+0.442	16 12.46	1 8.60	15 38 52.63
	17	15 27 42.14	10.335	18 51 7.8	37.13	15 4.57	0.477	16 12.66	1 8.72	15 42 49.19
	18	15 31 50.60	10.370	19 5 48.9	36.26	14 52.69	0.512	16 12.87	1 8.83	15 46 45.75
	19	15 35 59.92	10.405	19 20 9.5	35.42	14 39.96	0.547	16 13.07	1 8.94	15 50 42.30
	20	15 40 10.08	10.440	19 34 9.1	34.54	14 26.41	0.582	16 13.26	1 9.06	15 54 38.86
	21	15 44 21.06	10.474	−19 47 47.6	−33.65	−14 12.02	+0.616	16 13.46	1 9.17	15 58 35.41
	22	15 48 32.86	10.508	20 1 4.4	32.75	13 56.82	0.650	16 13.65	1 9.28	16 2 31.97
	23	15 52 45.46	10.541	20 13 59.3	31.82	13 40.82	0.683	16 13.84	1 9.39	16 6 28.53
	24	15 56 58.85	10.574	20 26 31.7	30.88	13 24.04	0.715	16 14.03	1 9.50	16 10 25.08
	25	16 1 13.00	10.606	20 38 41.5	29.92	13 6.49	0.747	16 14.22	1 9.60	16 14 21.64
	26	16 5 27.91	10.636	−20 50 28.2	−28.96	−12 48.18	+0.778	16 14.40	1 9.71	16 18 18.19
	27	16 9 43.56	10.666	21 1 51.5	27.98	12 29.14	0.808	16 14.58	1 9.81	16 22 14.75
	28	16 13 59.92	10.696	21 12 51.1	26.99	12 9.39	0.837	16 14.75	1 9.91	16 26 11.31
	29	16 18 16.98	10.725	21 23 26.7	25.97	11 48.95	0.866	16 14.93	1 10.01	16 30 7.86
	30	16 22 34.72	10.753	21 33 37.8	24.95	11 27.82	0.894	16 15.10	1 10.10	16 34 4.42
Dec.	1	16 26 53.12	10.780	−21 43 24.4	−23.92	−11 6.04	+0.921	16 15.26	1 10.19	16 38 0.98
	2	16 31 12.15	10.806	21 52 46.1	22.88	10 43.62	0.947	16 15.42	1 10.28	16 41 57.54
	3	16 35 31.80	10.831	22 1 42.5	21.82	10 20.59	0.972	16 15.58	1 10.37	16 45 54.09
	4	16 39 52.05	10.855	22 10 13.4	20.75	9 56.96	0.996	16 15.73	1 10.45	16 49 50.65
	5	16 44 12.87	10.879	22 18 18.6	19.68	9 32.76	1.020	16 15.87	1 10.53	16 53 47.21
	6	16 48 34.25	10.902	−22 25 57.8	−18.59	− 9 8.01	+1.043	16 16.01	1 10.60	16 57 43.76
	7	16 52 56.16	10.924	22 33 10.8	17.49	8 42.72	1.064	16 16.15	1 10.67	17 1 40.32
	8	16 57 18.60	10.945	22 39 57.3	16.38	8 16.92	1.085	16 16.28	1 10.74	17 5 36.88
	9	17 1 41.52	10.965	22 46 17.2	15.27	7 50.62	1.105	16 16.39	1 10.80	17 9 33.43
	10	17 6 4.92	10.984	22 52 10.0	14.14	7 23.85	1.125	16 16.50	1 10.86	17 13 29.99
	11	17 10 28.78	11.003	−22 57 35.9	−13.01	− 6 56.64	+1.143	16 16.61	1 10.92	17 17 26.55
	12	17 14 53.05	11.020	23 2 34.6	11.87	6 29.00	1.159	16 16.72	1 10.97	17 21 23.11
	13	17 19 17.70	11.035	23 7 5.8	10.72	6 0.98	1.175	16 16.82	1 11.02	17 25 19.66
	14	17 23 42.72	11.049	23 11 9.4	9.57	5 32.60	1.189	16 16.91	1 11.06	17 29 16.22
	15	17 28 8.07	11.062	23 14 45.3	8.41	5 3.89	1.203	16 17.00	1 11.10	17 33 12.78
	16	17 32 33.71	11.073	−23 17 53.4	− 7.25	− 4 34.88	+1.214	16 17.09	1 11.14	17 37 9.34
	17	17 36 59.60	11.084	23 20 33.5	6.09	4 5.62	1.224	16 17.17	1 11.17	17 41 5.90
	18	17 41 25.73	11.093	23 22 45.6	4.92	3 36.13	1.233	16 17.24	1 11.19	17 45 2.45
	19	17 45 52.03	11.099	23 24 29.4	3.74	3 6.47	1.239	16 17.31	1 11.21	17 48 59.01
	20	17 50 18.50	11.105	23 25 45.2	2.57	2 36.65	1.245	16 17.38	1 11.23	17 52 55.57
	21	17 54 45.07	11.109	−23 26 32.7	− 1.39	− 2 6.71	+1.249	16 17.44	1 11.24	17 56 52.13
	22	17 59 11.72	11.111	23 26 51.8	− 0.21	1 36.70	1.251	16 17.50	1 11.25	18 0 48.68
	23	18 3 38.40	11.112	23 26 42.6	+ 0.97	1 6.66	1.252	16 17.56	1 11.25	18 4 45.24
	24	18 8 5.08	11.111	23 26 5.2	2.15	0 36.62	1.251	16 17.62	1 11.25	18 8 41.80
	25	18 12 31.73	11.108	23 24 59.6	3.32	− 0 6.61	1.248	16 17.67	1 11.24	18 12 38.36
	26	18 16 58.29	11.104	−23 23 25.6	+ 4.50	+ 0 23.31	+1.244	16 17.71	1 11.23	18 16 34.92
	27	18 21 24.75	11.100	23 21 23.5	5.67	0 53.13	1.240	16 17.75	1 11.22	18 20 31.47
	28	18 25 51.05	11.092	23 18 53.1	6.85	1 22.80	1.232	16 17.79	1 11.20	18 24 28.03
	29	18 30 17.16	11.083	23 15 54.8	8.01	1 52.26	1.223	16 17.83	1 11.17	18 28 24.59
	30	18 34 43.05	11.074	23 12 28.5	9.18	2 21.51	1.214	16 17.85	1 11.14	18 32 21.15
	31	18 39 8.68	11.062	−23 8 34.2	+10.34	+ 2 50.51	+1.202	16 17.87	1 11.11	18 36 17.70

Note.—For mean time interval of semidiameter passing meridian, subtract $0^s.19$ from the sidereal interval.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan. 0	U	23 29.40	2.201	18 10 30.69	142.25	−21 40 43.0	+207.5	68.58	15 19.6	56 9.0	
1	L	11 55.80	2.197	18 38 57.25	142.07	20 49 59.4	299.4	68.53	15 24.2	56 26.0	
2	U	0 22.11	2.186	19 7 18.26	141.35	19 41 10.2	388.1	68.35	15 28.8	56 42.9	
2	L	12 48.22	2.167	19 35 27.91	140.20	18 15 6.0	471.6	68.07	15 33.3	56 59.3	
3	U	1 14.08	2.143	20 3 21.98	138.78	−16 32 57.9	+548.5	67.72	15 37.6	57 15.2	I. S.
3	L	13 39.64	2.117	20 30 58.04	137.23	14 36 14.1	617.4	67.35	15 41.7	57 30.3	
4	U	2 4.89	2.092	20 58 15.56	135.71	12 26 37.1	677.2	66.99	15 45.6	57 44.6	I. S.
4	L	14 29.86	2.070	21 25 15.83	134.37	10 5 59.6	727.3	66.67	15 49.2	57 57.9	
5	U	2 54.59	2.053	21 52 1.78	133.34	− 7 36 21.3	+767.2	66.44	15 52.6	58 10.2	I. S.
5	L	15 19.15	2.042	22 18 37.72	132.72	4 59 47.4	796.6	66.31	15 55.7	58 21.6	
6	U	3 43.63	2.040	22 45 9.02	132.59	− 2 18 26.1	815.2	66.31	15 58.6	58 32.1	I. S.
6	L	16 8.14	2.047	23 11 41.93	133.00	+ 0 25 31.5	822.7	66.45	16 1.2	58 41.6	
7	U	4 32.79	2.063	23 38 23.21	133.98	+ 3 9 51.6	+818.8	66.73	16 3.5	58 50.1	I. S.
7	L	16 57.69	2.089	0 5 19.86	135.55	5 52 17.1	803.4	67.15	16 5.5	58 57.7	
8	U	5 22.97	2.125	0 32 38.76	137.69	8 30 27.3	776.2	67.70	16 7.4	59 4.4	I. S.
8	L	17 48.72	2.169	1 0 26.35	140.32	11 1 57.6	736.8	68.37	16 8.9	59 10.0	
9	U	6 15.04	2.219	1 28 48.09	143.36	+13 24 18.8	+684.7	69.13	16 10.1	59 14.5	I. S.
9	L	18 41.99	2.274	1 57 48.03	146.66	15 34 59.5	620.0	69.94	16 11.0	59 17.9	
10	U	7 9.62	2.330	2 27 28.18	150.03	17 31 28.2	542.8	70.75	16 11.6	59 19.9	I. S.
10	L	19 37.90	2.383	2 57 47.98	153.22	19 11 18.2	453.7	71.51	16 11.7	59 20.3	
11	U	8 6.78	2.429	3 28 43.84	155.99	+20 32 14.1	+354.0	72.15	16 11.4	59 19.1	I. S.
11	L	20 36.15	2.463	4 0 9.02	158.06	21 32 19.6	245.7	72.61	16 10.5	59 16.0	
12	U	9 5.84	2.482	4 31 53.67	159.20	22 10 7.2	131.5	72.85	16 9.1	59 10.9	I. S.
12	L	21 35.65	2.483	5 3 45.66	159.26	22 24 45.6	+ 14.7	72.83	16 7.2	59 3.7	
13	U	10 5.36	2.465	5 35 31.52	158.18	+22 16 5.0	−101.1	72.54	16 4.6	58 54.3	I. *N.*S.
13	L	22 34.75	2.430	6 6 57.80	156.02	21 44 38.7	212.3	71.99	16 1.4	58 42.6	
14	U	11 3.61	2.378	6 37 52.29	152.93	20 51 40.8	315.8	71.23	15 57.7	58 28.9	I. *N.*S.
14	L	23 31.77	2.315	7 8 5.19	149.13	19 38 58.8	409.2	70.29	15 53.4	58 13.3	
15	U	11 59.13	2.244	7 37 29.60	144.89	+18 8 45.2	−490.9	69.24	15 48.7	57 55.9	I. *II.* S.
16	L	0 25.62	2.171	8 6 1.68	140.45	16 23 27.2	559.9	68.13	15 43.6	57 37.2	
16	U	12 51.23	2.098	8 33 40.60	136.05	14 25 37.4	616.2	67.02	15 38.2	57 17.4	II. S.
17	L	1 15.98	2.028	9 0 27.90	131.88	12 17 47.0	660.2	65.96	15 32.6	56 56.9	
17	U	13 39.93	1.965	9 26 27.04	128.06	+10 2 19.0	−692.6	64.99	15 26.9	56 36.1	II. S.
18	L	2 3.16	1.909	9 51 42.97	124.68	7 41 26.8	714.4	64.13	15 21.3	56 15.5	
18	U	14 25.77	1.861	10 16 21.49	121.83	5 17 11.1	726.7	63.40	15 15.9	55 55.4	II. S.
19	L	2 47.86	1.823	10 40 29.06	119.53	2 51 19.9	730.5	62.81	15 10.7	55 36.3	
19	U	15 9.55	1.794	11 4 12.36	117.79	+ 0 25 30.0	−726.6	62.36	15 5.8	55 18.5	II. S.
20	L	3 30.95	1.774	11 27 38.22	116.62	− 1 58 52.3	715.9	62.07	15 1.4	55 2.4	
20	U	15 52.18	1.764	11 50 53.45	116.01	4 20 29.2	699.1	61.94	14 57.5	54 48.2	II. S.
21	L	4 13.34	1.763	12 14 4.66	115.95	6 38 9.2	676.6	61.96	14 54.3	54 36.2	
21	U	16 34.53	1.771	12 37 18.29	116.41	− 8 50 45.1	−648.6	62.11	14 51.7	54 26.6	II. S.
22	L	4 55.87	1.787	13 0 40.46	117.36	10 57 12.9	615.2	62.39	14 49.8	54 19.6	
22	U	17 17.45	1.811	13 24 16.89	118.78	12 56 28.9	576.6	62.79	14 48.6	54 15.3	II. S.
23	L	5 39.35	1.841	13 48 12.86	120.61	14 47 28.8	532.5	63.29	14 48.2	54 13.7	
23	U	18 1.65	1.877	14 12 32.96	122.80	−16 29 6.8	−482.9	63.88	14 48.5	54 15.0	II. S.

Jan. 13, U Defective Illumination of *N.* 0″.65.
Jan. 14, U Defective Illumination of *N.* 0″.23.
Jan. 15, U Defective Illumination of *II.* 0″.05.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan. 23	U	18 1.65	1.877	14 12 32.96	122.80	−16 29 6.8	−482.9	63.88	14 48.5	54 15.0	II. S.
24	L	6 24.42	1.918	14 37 21.03	125.26	18 0 14.1	427.4	64.53	14 49.6	54 19.1	
24	U	18 47.70	1.962	15 2 39.94	127.91	19 19 39.9	365.9	65.22	14 51.5	54 26.0	II. S.
25	L	7 11.52	2.008	15 28 31.36	130.66	20 26 11.8	298.4	65.92	14 54.1	54 35.6	
25	U	19 35.89	2.053	15 54 55.63	133.37	−21 18 36.8	−224.8	66.60	14 57.4	54 47.8	II. S.
26	L	8 0.78	2.095	16 21 51.66	135.93	21 55 43.9	145.5	67.22	15 1.4	55 2.3	
26	U	20 26.16	2.133	16 49 16.77	138.20	22 16 27.7	− 61.1	67.76	15 5.9	55 18.9	II. S.
27	L	8 51.95	2.164	17 17 6.86	140.07	22 19 51.5	+ 27.6	68.20	15 10.9	55 37.3	
27	U	21 18.07	2.187	17 45 16.61	141.46	−22 5 11.7	+119.3	68.52	15 16.3	55 57.2	II. S.
28	L	9 44.42	2.202	18 13 39.90	142.32	21 32 1.8	212.4	68.70	15 22.1	56 18.2	
28	U	22 10.88	2.207	18 42 10.23	142.64	20 40 15.2	305.2	68.74	15 28.0	56 39.9	II. S.
29	L	10 37.36	2.204	19 10 41.36	142.47	19 30 7.8	395.6	68.67	15 34.0	57 1.9	
29	U	23 3.75	2.194	19 39 7.72	141.87	−18 2 18.9	+481.7	68.50	15 39.9	57 23.6	II. N.
30	L	11 30.00	2.179	20 7 24.99	140.97	16 17 50.4	561.8	68.26	15 45.7	57 44.7	
30	U	23 56.04	2.161	20 35 30.32	139.90	14 18 6.2	634.1	67.98	15 51.1	58 4.6	
31	L	12 21.87	2.143	21 3 22.47	138.80	12 4 48.6	697.1	67.70	15 56.1	58 23.0	
Feb. 1	U	0 47.49	2.127	21 31 1.88	137.80	− 9 39 56.3	+749.7	67.45	16 0.6	58 39.5	
1	L	13 12.92	2.114	21 58 30.50	137.02	7 5 41.1	790.8	67.26	16 4.5	58 53.9	
2	U	1 38.23	2.106	22 25 51.60	136.56	4 24 24.3	819.8	67.17	16 7.8	59 5.9	I. S.
2	L	14 3.49	2.105	22 53 9.48	136.49	− 1 38 34.8	836.3	67.18	16 10.4	59 15.5	
3	U	2 28.78	2.111	23 20 29.24	136.88	+ 1 9 13.9	+839.7	67.30	16 12.3	59 22.5	I. S.
3	L	14 54.19	2.126	23 47 56.43	137.74	3 56 25.4	830.0	67.54	16 13.5	59 27.1	
4	U	3 19.82	2.148	0 15 36.72	139.06	6 40 22.5	807.3	67.91	16 14.1	59 29.3	I. S.
4	L	15 45.76	2.177	0 43 35.55	140.82	9 18 27.7	771.4	68.39	16 14.2	59 29.4	
5	U	4 12.09	2.212	1 11 57.77	142.95	+11 48 6.2	+722.8	68.95	16 13.7	59 27.6	I. S.
5	L	16 38.86	2.252	1 40 47.14	145.32	14 6 46.4	661.9	69.56	16 12.7	59 23.9	
6	U	5 6.13	2.293	2 10 5.97	147.82	16 12 2.6	589.0	70.19	16 11.3	59 18.7	I. S.
6	L	17 33.90	2.334	2 39 54.64	150.26	18 1 38.5	505.2	70.80	16 9.5	59 12.2	
7	U	6 2.13	2.370	3 10 11.27	152.44	+19 33 30.4	+411.9	71.34	16 7.4	59 4.6	I. S.
7	L	18 30.75	2.399	3 40 51.55	154.17	20 45 53.2	310.7	71.76	16 5.1	58 56.0	
8	U	6 59.65	2.417	4 11 48.80	155.24	21 37 24.7	203.8	72.00	16 2.5	58 46.5	I. S.
8	L	19 28.69	2.421	4 42 54.27	155.52	22 7 10.9	+ 93.7	72.04	15 59.7	58 36.2	
9	U	7 57.70	2.411	5 13 57.87	154.93	+22 14 50.4	− 16.9	71.87	15 56.7	58 25.2	I. S.
9	L	20 26.50	2.387	5 44 48.99	153.45	22 0 34.8	125.1	71.48	15 53.5	58 13.4	
10	U	8 54.93	2.349	6 15 17.47	151.17	21 25 8.5	228.2	70.89	15 50.1	58 1.0	I. *N*. S.
10	L	21 22.83	2.300	6 45 14.51	148.23	20 29 46.0	324.1	70.14	15 46.5	57 48.0	
11	U	9 50.10	2.243	7 14 33.18	144.81	+19 16 5.5	−410.9	69.26	15 42.8	57 34.3	I. N. *S*.
11	L	22 16.65	2.182	7 43 8.87	141.11	17 46 3.5	487.6	68.30	15 38.9	57 19.9	
12	U	10 42.45	2.118	8 10 59.35	137.31	16 1 47.4	553.3	67.31	15 34.8	57 5.0	I. N. *S*.
12	L	23 7.49	2.056	8 38 4.49	133.58	14 5 30.0	607.8	66.34	15 30.6	56 49.6	
13	U	11 31.81	1.996	9 4 26.03	130.05	+11 59 24.1	−651.3	65.42	15 26.3	56 33.9	I. *N*. S.
13	L	23 55.46	1.945	9 30 7.13	126.85	9 45 39.2	684.3	64.57	15 22.0	56 17.9	
14	U	12 18.51	1.898	9 55 12.06	124.03	7 26 18.8	707.4	63.82	15 17.6	56 1.9	*I*. II. S.
15	L	0 41.04	1.858	10 19 45.83	121.67	5 3 18.7	721.2	63.19	15 13.3	55 46.2	
15	U	13 3.14	1.827	10 43 53.93	119.77	+ 2 38 26.3	−726.3	62.69	15 9.1	55 30.8	II. S.

Feb. 10, U Defective Illumination of *N*. 0″.01.
Feb. 11, U Defective Illumination of *S*. 0″.21.
Feb. 12, U Defective Illumination of *S*. 0″.04.
Feb. 13, U Defective Illumination of *N*. 0″.43.
Feb. 14, U Defective Illumination of I. 0″.01.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Feb.15	U	13 3.14	1.827	10 43 53.93	119.77	+ 2 38 26.3	−726.3	62.69	15 9.1	55 30.8	II. S.
16	L	1 24.91	1.803	11 7 42.09	118.35	+ 0 13 21.1	723.4	62.32	15 5.1	55 16.0	
16	U	13 46.45	1.788	11 31 16.12	117.41	− 2 10 25.4	713.2	62.09	15 1.3	55 2.1	II. S.
17	L	2 7.85	1.780	11 54 41.79	116.95	4 31 28.5	696.2	62.00	14 57.9	54 49.4	
17	U	14 29.20	1.780	12 18 4.74	116.96	− 6 48 29.8	−672.9	62.03	14 54.8	54 38.1	II. S.
18	L	2 50.60	1.787	12 41 30.46	117.40	9 0 15.2	643.6	62.18	14 52.1	54 28.4	
18	U	15 12.13	1.802	13 5 4.05	118.26	11 5 34.5	608.6	62.45	14 50.0	54 20.6	II. S.
19	L	3 33.87	1.823	13 28 50.31	119.51	13 3 20.3	568.1	62.82	14 48.5	54 14.9	
19	U	15 55.89	1.849	13 52 53.52	121.09	−14 52 26.1	−522.0	63.28	14 47.6	54 11.5	II. S.
20	L	4 18.26	1.880	14 17 17.47	122.95	16 31 47.0	470.5	63.81	14 47.3	54 10.6	
20	U	16 41.02	1.914	14 42 5.22	125.04	18 0 17.9	413.7	64.39	14 47.7	54 12.2	II. S.
21	L	5 4.21	1.952	15 7 18.96	127.28	19 16 54.2	351.5	65.00	14 48.9	54 16.5	
21	U	17 27.86	1.990	15 33 0.02	129.58	−20 20 32.1	−284.0	65.62	14 50.8	54 23.6	II. S.
22	L	5 51.97	2.028	15 59 8.68	131.85	21 10 8.9	211.4	66.22	14 53.5	54 33.5	
22	U	18 16.52	2.064	16 25 44.04	134.02	21 44 45.1	133.9	66.78	14 57.0	54 46.1	II. S.
23	L	6 41.48	2.096	16 52 44.18	135.97	22 3 26.4	− 52.3	67.27	15 1.2	55 1.4	
23	U	19 6.81	2.124	17 20 6.09	137.64	−22 5 25.4	+ 32.9	67.68	15 6.0	55 19.3	II. S.
24	L	7 32.43	2.146	17 47 45.98	138.95	21 50 5.0	120.8	67.99	15 11.5	55 39.5	
24	U	19 58.28	2.162	18 15 39.51	139.90	21 17 0.2	210.2	68.20	15 17.6	56 1.8	II. N.
25	L	8 24.28	2.171	18 43 42.13	140.48	20 26 1.5	299.6	68.31	15 24.2	56 25.9	
25	U	20 50.36	2.175	19 11 49.48	140.70	−19 17 16.3	+387.6	68.33	15 31.1	56 51.4	II. N.
26	L	9 16.46	2.174	19 39 57.71	140.64	17 51 10.4	472.7	68.28	15 38.3	57 17.7	
26	U	21 42.52	2.169	20 8 3.92	140.38	16 8 29.6	553.2	68.18	15 45.5	57 44.3	II. N.
27	L	10 8.52	2.163	20 36 6.30	140.02	14 10 19.3	627.4	68.05	15 52.7	58 10.7	
27	U	22 34.44	2.157	21 4 4.27	139.66	−11 58 5.1	+693.6	67.94	15 59.7	58 36.3	II. N.
28	L	11 0.30	2.153	21 31 58.50	139.41	9 33 31.9	750.3	67.86	16 6.3	59 0.3	
28	U	23 26.13	2.153	21 59 50.96	139.37	6 58 42.4	796.0	67.83	16 12.2	59 22.1	
Mar. 1	L	11 51.98	2.157	22 27 44.56	139.62	4 15 56.2	829.5	67.87	16 17.4	59 41.3	
2	U	0 17.92	2.167	22 55 43.12	140.20	− 1 27 48.0	+849.5	68.02	16 21.8	59 57.3	
2	L	12 44.01	2.183	23 23 51.00	141.17	+ 1 22 55.7	855.2	68.27	16 25.1	60 9.6	
3	U	1 10.33	2.205	23 52 12.84	142.54	4 13 18.6	846.0	68.62	16 27.4	60 18.1	
3	L	13 36.96	2.234	0 20 53.14	144.24	7 0 18.6	821.4	69.07	16 28.7	60 22.6	
4	U	2 3.96	2.267	0 49 55.85	146.25	+ 9 40 51.2	+781.4	69.59	16 28.8	60 23.2	I. S.
4	L	14 31.38	2.304	1 19 24.01	148.46	12 11 54.7	726.6	70.17	16 28.0	60 20.0	
5	U	2 59.25	2.342	1 49 19.19	150.74	14 30 34.2	657.7	70.76	16 26.2	60 13.3	I. S.
5	L	15 27.57	2.378	2 19 41.19	152.90	16 34 7.8	575.9	71.31	16 23.5	60 3.5	
6	U	3 56.29	2.409	2 50 27.59	154.77	+18 20 11.9	+483.0	71.79	16 20.1	59 51.0	I. S.
6	L	16 25.34	2.432	3 21 33.68	156.15	19 46 46.6	381.4	72.15	16 16.1	59 36.4	
7	U	4 54.61	2.444	3 52 52.56	156.87	20 52 21.2	273.6	72.35	16 11.7	59 20.1	I. S.
7	L	17 23.94	2.442	4 24 15.45	156.81	21 35 58.1	162.3	72.35	16 6.9	59 2.6	
8	U	5 53.17	2.427	4 55 32.50	155.90	+21 57 14.7	+ 50.6	72.14	16 1.9	58 44.3	I. S.
8	L	18 22.14	2.398	5 26 33.56	154.14	21 56 23.4	− 58.6	71.71	15 56.8	58 25.5	
9	U	6 50.68	2.357	5 57 9.01	151.65	21 34 9.2	162.8	71.09	15 51.6	58 6.7	I. *N*.S.
9	L	19 18.66	2.305	6 27 10.71	148.55	20 51 44.3	260.0	70.31	15 46.5	57 48.0	
10	U	7 45.97	2.246	6 56 32.43	145.02	+19 50 42.7	−348.7	69.42	15 41.5	57 29.7	I. N.

Mar. 9, U Defective Illumination of *N*. 0″.05.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Mar.10	U	7 45.97	2.246	6 56 32.43	145.02	+19 50 42.7	−348.7	69.42	15 41.5	57 29.7	I. N.
10	L	20 12.56	2.184	7 25 10.14	141.26	18 32 53.9	427.8	68.45	15 36.7	57 11.8	
11	U	8 38.38	2.120	7 53 2.13	137.42	17 0 15.8	496.8	67.45	15 32.0	56 54.5	I. N.
11	L	21 3.45	2.058	8 20 8.63	133.69	15 14 50.1	555.7	66.46	15 27.4	56 37.8	
12	U	9 27.80	2.000	8 46 31.61	130.19	+13 18 38.6	−604.5	65.52	15 23.0	56 21.7	I. N.
12	L	21 51.47	1.947	9 12 14.37	127.00	11 13 40.0	643.6	64.65	15 18.8	56 6.3	
13	U	10 14.55	1.900	9 37 21.17	124.20	9 1 48.3	673.4	63.88	15 14.8	55 51.5	I. N.
13	L	22 37.11	1.861	10 1 56.97	121.84	6 44 52.2	694.4	63.23	15 11.0	55 37.4	
14	U	10 59.25	1.829	10 26 7.09	119.92	+ 4 24 34.2	−707.1	62.69	15 7.3	55 24.0	I. N.*S.*
14	L	23 21.05	1.805	10 49 57.06	118.48	+ 2 2 31.9	711.9	62.28	15 3.8	55 11.3	
15	U	11 42.61	1.789	11 13 32.42	117.49	− 0 19 42.6	709.2	62.00	15 0.6	54 59.3	I. S.
16	L	0 4.02	1.780	11 36 58.67	116.95	2 40 41.6	699.4	61.85	14 57.6	54 48.2	
16	U	12 25.37	1.778	12 0 21.11	116.85	− 4 59 1.5	−682.8	61.82	14 54.8	54 38.0	II. S.
17	L	0 46.73	1.783	12 23 44.76	117.16	7 13 22.3	659.6	61.91	14 52.3	54 28.9	
17	U	13 8.19	1.795	12 47 14.37	117.84	9 22 27.0	630.1	62.11	14 50.1	54 21.0	II. S.
18	L	1 29.83	1.812	13 10 54.22	118.86	11 25 0.8	594.5	62.41	14 48.3	54 14.4	
18	U	13 51.69	1.834	13 34 48.17	120.18	−13 19 51.1	−553.0	62.79	14 46.9	54 9.2	II. S.
19	L	2 13.85	1.860	13 58 59.46	121.74	15 5 48.0	505.6	63.24	14 46.0	54 5.7	
19	U	14 36.34	1.889	14 23 30.70	123.49	16 41 43.2	452.7	63.74	14 45.5	54 4.0	II. S.
20	L	2 59.19	1.920	14 48 23.74	125.36	18 6 30.7	394.3	64.28	14 45.6	54 4.3	
20	U	15 22.42	1.952	15 13 39.65	127.29	−19 19 7.3	−330.9	64.82	14 46.2	54 6.7	II. S.
21	L	3 46.03	1.983	15 39 18.53	129.19	20 18 33.4	262.7	65.35	14 47.5	54 11.3	
21	U	16 10.01	2.013	16 5 19.66	130.98	21 3 54.5	190.1	65.85	14 49.4	54 18.4	II. S.
22	L	4 34.34	2.040	16 31 41.45	132.61	21 34 21.2	113.7	66.30	14 52.0	54 27.9	
22	U	16 58.97	2.064	16 58 21.50	134.02	−21 49 10.9	− 34.1	66.69	14 55.3	54 40.0	II. S.
23	L	5 23.85	2.083	17 25 16.85	135.16	21 47 50.1	+ 47.9	67.00	14 59.3	54 54.8	
23	U	17 48.93	2.097	17 52 24.15	136.01	21 29 54.6	131.5	67.23	15 4.1	55 12.1	II. *N.*S.
24	L	6 14.16	2.107	18 19 40.00	136.58	20 55 11.3	215.7	67.38	15 9.5	55 31.9	
24	U	18 39.47	2.112	18 47 1.12	136.90	−20 3 38.7	+299.5	67.45	15 15.5	55 54.1	II. N.
25	L	7 4.82	2.114	19 14 24.79	137.02	18 55 28.0	381.9	67.46	15 22.1	56 18.5	
25	U	19 30.18	2.113	19 41 48.99	137.00	17 31 3.6	461.6	67.44	15 29.3	56 44.8	II. N.
26	L	7 55.54	2.112	20 9 12.66	136.94	15 51 3.6	537.6	67.40	15 36.9	57 12.6	
26	U	20 20.88	2.112	20 36 35.75	136.92	−13 56 20.7	+608.6	67.36	15 44.8	57 41.6	II. N.
27	L	8 46.23	2.114	21 3 59.37	137.04	11 48 2.3	673.3	67.36	15 52.8	58 11.0	
27	U	21 11.63	2.119	21 31 25.65	137.38	9 27 32.6	730.3	67.41	16 0.8	58 40.4	II. N.
28	L	9 37.12	2.130	21 58 57.73	138.02	6 56 31.9	778.2	67.54	16 8.6	59 9.0	
28	U	22 2.78	2.147	22 26 39.60	139.03	− 4 16 59.1	+815.4	67.76	16 16.0	59 36.0	II. N.
29	L	10 28.68	2.170	22 54 35.88	140.43	− 1 31 11.2	840.4	68.09	16 22.7	60 0.7	
29	U	22 54.90	2.201	23 22 51.56	142.25	+ 1 18 16.0	851.7	68.53	16 28.6	60 22.4	II. N.
30	L	11 21.52	2.238	23 51 31.71	144.50	4 8 29.2	847.9	69.07	16 33.5	60 40.3	
30	U	23 48.63	2.281	0 20 40.99	147.10	+ 6 56 20.2	+827.8	69.71	16 37.2	60 53.9	
31	L	12 16.29	2.329	0 50 23.26	149.98	9 38 29.0	790.7	70.41	16 39.6	61 2.7	
Apr. 1	U	0 44.53	2.379	1 20 40.96	152.98	12 11 30.2	736.5	71.14	16 40.6	61 6.5	
1	L	13 13.38	2.428	1 51 34.61	155.92	14 31 59.9	665.7	71.87	16 40.3	61 5.2	
2	U	1 42.79	2.472	2 23 2.17	158.60	+16 36 45.6	+579.5	72.54	16 38.6	60 59.0	I. S.

Mar. 14, U Defective Illumination of *S.* 0″.11. **Mar. 23, U Defective Illumination of *N.* 0″.06.**

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 2	U	1 42.79	2.472	2 23 2.17	158.60	+16 36 45.6	+579.5	72.54	16 38.6	60 59.0	I. S.
2	L	14 12.68	2.508	2 54 58.80	160.74	18 22 55.3	480.1	73.07	16 35.6	60 48.2	
3	U	2 42.92	2.531	3 27 16.68	162.10	19 48 8.2	370.5	73.43	16 31.6	60 33.3	I. S.
3	L	15 13.35	2.538	3 59 45.43	162.52	20 50 42.8	254.4	73.56	16 26.6	60 14.9	
4	U	3 43.75	2.527	4 32 12.80	161.87	+21 29 42.7	+135.5	73.43	16 20.8	59 53.7	I. S.
4	L	16 13.91	2.498	5 4 25.83	160.14	21 44 59.1	+ 17.7	73.05	16 14.4	59 30.4	
5	U	4 43.63	2.453	5 36 12.05	157.41	21 37 7.8	− 95.3	72.43	16 7.7	59 5.7	I. S.
5	L	17 12.72	2.394	6 7 20.60	153.89	21 7 22.4	200.8	71.60	16 0.8	58 40.2	
6	U	5 41.05	2.326	6 37 43.14	149.79	+20 17 25.8	−296.8	70.61	15 53.8	58 14.6	I. N.
6	L	18 8.52	2.252	7 7 14.23	145.35	19 9 20.2	382.2	69.52	15 46.9	57 49.3	
7	U	6 35.09	2.177	7 35 51.31	140.82	17 45 17.8	456.3	68.39	15 40.2	57 24.8	I. N.
7	L	19 0.77	2.103	8 3 34.50	136.40	16 7 32.7	519.3	67.26	15 33.8	57 1.2	
8	U	7 25.59	2.034	8 30 26.08	132.25	+14 18 16.0	−571.7	66.17	15 27.7	56 38.9	I. N.
8	L	19 49.62	1.971	8 56 29.91	128.47	12 19 32.3	613.9	65.16	15 22.0	56 18.0	
9	U	8 12.93	1.916	9 21 51.08	125.15	10 13 18.0	646.9	64.26	15 16.7	55 58.6	I. N.
9	L	20 35.64	1.869	9 46 35.40	122.33	8 1 20.1	671.3	63.48	15 11.9	55 40.8	
10	U	8 57.84	1.831	10 10 49.06	120.04	+ 5 45 18.4	−687.7	62.83	15 7.4	55 24.5	I. N.
10	L	21 19.63	1.802	10 34 38.43	118.28	3 26 45.2	696.6	62.32	15 3.4	55 9.8	
11	U	9 41.12	1.781	10 58 9.84	117.04	+ 1 7 7.0	698.6	61.95	14 59.8	54 56.5	I. N.
11	L	22 2.42	1.769	11 21 29.42	116.30	− 1 12 13.6	693.8	61.72	14 56.6	54 44.7	
12	U	10 23.62	1.765	11 44 43.08	116.04	− 3 29 57.8	−682.6	61.62	14 53.8	54 34.3	I. N.
12	L	22 44.81	1.768	12 7 56.38	116.23	5 44 48.7	664.9	61.64	14 51.3	54 25.3	
13	U	11 6.08	1.778	12 31 14.49	116.84	7 55 30.9	641.0	61.79	14 49.2	54 17.5	I. N.*S.*
13	L	23 27.51	1.794	12 54 42.04	117.81	10 0 49.5	610.9	62.04	14 47.4	54 11.1	
14	U	11 49.16	1.816	13 18 23.15	119.10	−11 59 30.5	−574.8	62.38	14 46.0	54 6.0	I. *II.* S.
15	L	0 11.10	1.841	13 42 21.29	120.64	13 50 20.3	532.5	62.80	14 45.0	54 2.2	
15	U	12 33.37	1.870	14 6 39.14	122.37	15 32 6.3	484.2	63.27	14 44.4	53 59.8	II. S.
16	L	0 55.99	1.901	14 31 18.59	124.22	17 3 37.6	430.1	63.78	14 44.1	53 58.8	
16	U	13 18.99	1.932	14 56 20.55	126.11	−18 23 45.7	−370.4	64.30	14 44.2	53 59.3	II. S.
17	L	1 42.36	1.963	15 21 44.97	127.95	19 31 26.2	305.5	64.81	14 44.8	54 1.3	
17	U	14 6.09	1.991	15 47 30.79	129.66	20 25 39.9	236.1	65.28	14 45.8	54 4.9	II. S.
18	L	2 30.14	2.016	16 13 36.00	131.17	21 5 35.0	162.6	65.71	14 47.3	54 10.4	
18	U	14 54.46	2.037	16 39 57.78	132.41	−21 30 27.6	− 85.8	66.07	14 49.3	54 17.8	II. S.
19	L	3 19.01	2.053	17 6 32.66	133.35	21 39 44.4	− 6.8	66.34	14 51.8	54 27.1	
19	U	15 43.70	2.063	17 33 16.80	133.96	21 33 2.7	+ 73.8	66.53	14 54.9	54 38.5	II. *N.* S.
20	L	4 8.49	2.068	18 0 6.34	134.24	21 10 11.6	154.7	66.64	14 58.6	54 52.1	
20	U	16 33.31	2.068	18 26 57.65	134.26	−20 31 11.8	+235.1	66.67	15 2.9	55 7.9	II. N.
21	L	4 58.10	2.064	18 53 47.71	134.05	19 36 16.0	313.9	66.64	15 7.8	55 26.0	
21	U	17 22.84	2.058	19 20 34.33	133.70	18 25 47.4	390.4	66.56	15 13.3	55 46.2	II. N.
22	L	5 47.50	2.052	19 47 16.39	133.31	17 0 19.6	463.6	66.47	15 19.4	56 8.6	
22	U	18 12.09	2.046	20 13 53.85	132.96	−15 20 35.9	+532.8	66.38	15 26.1	56 33.0	II. N.
23	L	6 36.62	2.043	20 40 27.92	132.76	13 27 29.9	597.3	66.33	15 33.2	56 59.1	
23	U	19 1.13	2.044	21 7 0.98	132.80	11 22 4.3	656.0	66.33	15 40.7	57 26.7	II. N.
24	L	7 25.68	2.050	21 33 36.53	133.19	9 5 32.0	708.2	66.41	15 48.6	57 55.4	
24	U	19 50.35	2.063	22 0 19.04	133.98	− 6 39 18.3	+752.7	66.59	15 56.6	58 24.7	II. N.

Apr. 13, U Defective Illumination of S. 0″.02.
Apr. 14, U Defective Illumination of II. 0″.06.

Apr. 19, U Defective Illumination of *N.* 0″.29.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 24	U	19 50.35	2.063	22 0 19.04	133.98	− 6 39 18.3	+752.7	66.59	15 56.6	58 24.7	II. N.
25	L	8 15.23	2.084	22 27 13.79	135.23	4 5 1.5	788.4	66.89	16 4.6	58 54.1	
25	U	20 40.40	2.113	22 54 26.76	137.01	− 1 24 35.3	814.0	67.31	16 12.4	59 22.8	II. N.
26	L	9 5.99	2.152	23 22 4.29	139.33	+ 1 19 48.9	827.8	67.87	16 19.8	59 50.1	
26	U	21 32.09	2.199	23 50 12.82	142.18	+ 4 5 41.3	+828.4	68.56	16 26.7	60 15.3	II. N.
27	L	9 58.80	2.255	0 18 58.45	145.51	6 50 12.3	814.0	69.36	16 32.8	60 37.6	
27	U	22 26.22	2.317	0 48 26.49	149.22	9 30 13.9	783.3	70.24	16 37.8	60 56.1	II. N.
28	L	10 54.41	2.382	1 18 40.72	153.17	12 2 23.1	735.2	71.18	16 41.6	61 10.2	
28	U	23 23.39	2.448	1 49 42.74	157.14	+14 23 8.5	+669.3	72.12	16 44.1	61 19.3	
29	L	11 53.15	2.510	2 21 31.21	160.86	16 28 57.9	586.1	73.01	16 45.2	61 23.1	
30	U	0 23.60	2.562	2 54 1.24	164.01	18 16 32.3	487.2	73.75	16 44.7	61 21.4	
30	L	12 54.59	2.600	3 27 4.07	166.28	19 42 58.7	375.4	74.29	16 42.7	61 14.2	
May 1	U	1 25.92	2.618	4 0 27.35	167.38	+20 46 4.5	+254.5	74.57	16 39.4	61 1.9	I. S.
1	L	13 57.34	2.614	4 33 55.92	167.15	21 24 28.3	129.2	74.54	16 34.8	60 44.9	
2	U	2 28.57	2.587	5 7 13.33	165.53	21 37 46.3	+ 4.4	74.19	16 29.0	60 23.9	I. S.
2	L	14 59.35	2.539	5 40 3.49	162.64	21 26 31.6	−115.5	73.54	16 22.4	59 59.7	
3	U	3 29.44	2.474	6 12 12.35	158.69	+20 52 7.4	−226.7	72.64	16 15.1	59 33.0	I. N.
3	L	15 58.67	2.396	6 43 29.05	154.00	19 56 35.1	326.6	71.54	16 7.4	59 4.7	
4	U	4 26.91	2.311	7 13 46.58	148.88	18 42 20.6	413.6	70.33	15 59.5	58 35.6	I. N.
4	L	16 54.12	2.224	7 43 1.71	143.64	17 12 1.0	487.4	69.06	15 51.6	58 6.4	
5	U	5 20.29	2.139	8 11 14.63	138.54	+15 28 13.8	−548.3	67.79	15 43.7	57 37.6	I. N.
5	L	17 45.48	2.060	8 38 28.19	133.78	13 33 29.5	597.1	66.58	15 36.1	57 9.8	
6	U	6 9.76	1.988	9 4 47.19	129.47	11 30 7.3	634.9	65.47	15 28.9	56 43.4	I. N.
6	L	18 33.23	1.926	9 30 17.80	125.72	9 20 12.2	662.7	64.48	15 22.2	56 18.6	
7	U	6 56.02	1.874	9 55 6.93	122.57	+ 7 5 36.8	−681.7	63.62	15 15.9	55 55.7	I. N.
7	L	19 18.23	1.831	10 19 21.85	120.03	4 48 1.4	692.9	62.92	15 10.2	55 34.8	
8	U	7 40.00	1.799	10 43 9.92	118.09	2 28 55.5	696.9	62.38	15 5.1	55 16.1	I. N.
8	L	20 1.45	1.777	11 6 38.39	116.75	+ 0 9 41.1	694.4	61.99	15 0.6	54 59.6	
9	U	8 22.68	1.764	11 29 54.23	115.98	− 2 8 25.9	−685.7	61.75	14 56.7	54 45.1	I. N.
9	L	20 43.82	1.760	11 53 4.06	115.75	4 24 13.8	671.2	61.66	14 53.4	54 32.8	
10	U	9 4.96	1.764	12 16 14.09	116.01	6 36 32.7	651.0	61.70	14 50.6	54 22.5	I. N.
10	L	21 26.19	1.776	12 39 30.01	116.72	8 44 13.9	624.9	61.86	14 48.3	54 14.1	
11	U	9 47.61	1.795	13 2 56.95	117.84	−10 46 8.3	−593.1	62.13	14 46.5	54 7.6	I. N.
11	L	22 9.29	1.819	13 26 39.36	119.29	12 41 6.1	555.5	62.50	14 45.2	54 2.9	
12	U	10 31.28	1.847	13 50 40.91	121.01	14 27 56.8	512.0	62.94	14 44.4	53 59.8	I. N.
12	L	22 53.64	1.879	14 15 4.40	122.93	16 5 28.8	462.4	63.42	14 43.9	53 58.2	
13	U	11 16.39	1.913	14 39 51.59	124.95	−17 32 31.4	−407.0	63.94	14 43.9	53 58.2	I. N.*S.*
13	L	23 39.55	1.947	15 5 3.12	126.97	18 47 55.1	346.0	64.47	14 44.3	53 59.7	
14	U	12 3.11	1.979	15 30 38.50	128.90	19 50 34.3	279.7	64.97	14 45.0	54 2.5	*I.* II. *N.* S.
15	L	0 27.03	2.008	15 56 35.97	130.64	20 39 28.8	208.7	65.43	14 46.2	54 6.7	
15	U	12 51.27	2.032	16 22 52.68	132.10	−21 13 46.3	−133.7	65.82	14 47.7	54 12.3	II. *N.* S.
16	L	1 15.76	2.050	16 49 24.82	133.20	21 32 45.1	− 55.7	66.12	14 49.6	54 19.2	
16	U	13 40.44	2.062	17 16 7.89	133.91	21 35 55.4	+ 24.2	66.33	14 51.9	54 27.6	II. *N.* S.
17	L	2 5.22	2.067	17 42 57.02	134.21	21 23 0.8	104.9	66.44	14 54.6	54 37.4	
17	U	14 30.02	2.066	18 9 47.43	134.12	−20 53 59.1	+185.2	66.45	14 57.7	54 48.7	II. N.*S.*

May 13, U Defective Illumination of *S.* 0″.00.
May 14, U Defective Illumination of *I.* 0″.02.
May 14, U Defective Illumination of *N.* 0″.41.
May 15, U Defective Illumination of N. 0″.72.
May 16, U Defective Illumination of N. 0″.12.
May 17, U Defective Illumination of S. 0″.[illegible].

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
May 17	U	14 30.02	2.066	18 9 47.43	134.12	−20 53 59.1	+185.2	66.45	14 57.7	54 48.7	II. N. *S.*
18	L	2 54.77	2.059	18 36 34.75	133.71	20 9 2.5	263.9	66.37	15 1.2	55 1.5	
18	U	15 19.41	2.048	19 3 15.43	133.04	19 8 35.7	340.1	66.23	15 5.1	55 15.9	II. N.
19	L	3 43.90	2.034	19 29 46.99	132.21	17 53 15.9	412.7	66.05	15 9.5	55 32.0	
19	U	16 8.22	2.019	19 56 8.26	131.33	−16 23 49.7	+481.0	65.85	15 14.3	55 49.7	II. N.
20	L	4 32.36	2.006	20 22 19.34	130.53	14 41 12.7	544.3	65.67	15 19.6	56 9.0	
20	U	16 56.37	1.995	20 48 21.78	129.91	12 46 27.9	602.2	65.53	15 25.3	56 29.9	II. N.
21	L	5 20.27	1.990	21 14 18.37	129.58	10 40 44.5	654.0	65.46	15 31.4	56 52.3	
21	U	17 44.15	1.991	21 40 13.09	129.62	− 8 25 18.8	+699.1	65.48	15 37.8	57 16.1	II. N.
22	L	6 8.08	1.999	22 6 11.00	130.11	6 1 33.5	737.1	65.61	15 44.6	57 40.9	
22	U	18 32.16	2.016	22 32 17.99	131.14	3 31 0.4	767.0	65.87	15 51.6	58 6.5	II. N.
23	L	6 56.50	2.043	22 58 40.69	132.74	− 0 55 20.7	788.1	66.28	15 58.7	58 32.6	
23	U	19 21.22	2.079	23 25 26.24	134.95	+ 1 43 32.0	+799.0	66.83	16 5.8	58 58.6	II. N.
24	L	7 46.44	2.126	23 52 42.03	137.78	4 23 29.0	798.6	67.52	16 12.7	59 24.0	
24	U	20 12.28	2.183	0 20 35.26	141.19	7 2 5.8	785.3	68.36	16 19.3	59 48.2	II. N.
25	L	8 38.86	2.248	0 49 12.63	145.12	9 36 40.3	757.9	69.32	16 25.4	60 10.6	
25	U	21 6.27	2.320	1 18 39.65	149.44	+12 4 13.5	+714.9	70.35	16 30.8	60 30.3	II. N.
26	L	9 34.56	2.395	1 48 59.94	153.96	14 21 32.0	655.3	71.42	16 35.2	60 46.6	
26	U	22 3.75	2.469	2 20 14.38	158.42	16 25 14.2	578.9	72.46	16 38.6	60 59.0	II. N.
27	L	10 33.79	2.537	2 52 20.30	162.48	18 12 0.5	486.2	73.40	16 40.7	61 6.9	
27	U	23 4.58	2.592	3 25 10.94	165.80	+19 38 45.2	+379.1	74.16	16 41.5	61 9.8	
28	L	11 35.93	2.629	3 58 35.19	168.03	20 42 52.6	260.6	74.67	16 40.9	61 7.6	
29	U	0 7.59	2.643	4 32 18.20	168.89	21 22 31.1	135.1	74.87	16 38.9	61 0.3	
29	L	12 39.27	2.632	5 6 2.59	168.24	21 36 45.5	+ 7.5	74.73	16 35.6	60 48.0	
30	U	1 10.67	2.597	5 39 30.23	166.11	+21 25 41.7	−117.2	74.25	16 31.0	60 31.1	I. N.
30	L	13 41.52	2.540	6 12 24.19	162.67	20 50 24.8	234.1	73.46	16 25.3	60 10.3	
31	U	2 11.57	2.466	6 44 30.48	158.23	19 52 48.9	339.8	72.43	16 18.7	59 46.2	I. N.
31	L	14 40.66	2.381	7 15 39.09	153.12	18 35 23.4	432.0	71.24	16 11.5	59 19.6	
June 1	U	3 8.70	2.291	7 45 44.31	147.72	+17 0 58.2	−509.7	69.95	16 3.8	58 51.3	I. N.
1	L	15 35.66	2.202	8 14 44.44	142.32	15 12 28.3	572.9	68.64	15 55.8	58 22.1	
2	U	4 1.56	2.116	8 42 41.10	137.18	13 12 44.0	622.3	67.38	15 47.8	57 52.6	I. N.
2	L	16 26.48	2.038	9 9 38.56	132.48	11 4 22.9	659.2	66.20	15 39.9	57 23.5	
3	U	4 50.51	1.969	9 35 42.70	128.31	+ 8 49 48.1	−684.9	65.13	15 32.2	56 55.4	I. N.
3	L	17 13.77	1.910	10 1 0.56	124.77	6 31 5.6	700.8	64.21	15 24.9	56 28.7	
4	U	5 36.39	1.862	10 25 39.74	121.87	4 10 5.3	708.1	63.45	15 18.1	56 3.8	I. N.
4	L	17 58.49	1.824	10 49 47.99	119.62	+ 1 48 23.4	707.8	62.84	15 11.9	55 40.9	
5	U	6 20.21	1.797	11 13 33.04	118.00	− 0 32 34.9	−700.8	62.40	15 6.3	55 20.3	I. N.
5	L	18 41.67	1.781	11 37 2.36	116.99	2 51 33.1	687.8	62.12	15 1.3	55 2.1	
6	U	7 2.99	1.774	12 0 23.12	116.57	5 7 21.6	669.2	61.99	14 57.1	54 46.4	I. N.
6	L	19 24.28	1.775	12 23 42.03	116.67	7 18 54.4	645.2	62.00	14 53.5	54 33.2	
7	U	7 45.64	1.785	12 47 5.30	117.28	− 9 25 7.4	−615.9	62.14	14 50.6	54 22.5	I. N.
7	L	20 7.16	1.803	13 10 38.56	118.33	11 24 56.6	581.3	62.40	14 48.3	54 14.1	
8	U	8 28.93	1.827	13 34 26.78	119.76	13 17 18.1	541.3	62.75	14 46.6	54 8.1	I. N.
8	L	20 51.02	1.856	13 58 34.08	121.50	15 1 6.3	495.7	63.19	14 45.6	54 4.4	
9	U	9 13.48	1.889	14 23 3.71	123.47	−16 35 14.1	−444.5	63.69	14 45.2	54 2.8	I. N.

May 17, U Defective Illumination of *S.* 0″.43.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
une 9	U	9 13.48	1.889	14 23 3.71	123.47	−16 35 14.1	−444.5	63.69	14 45.2	54 2.8	I. N.
9	L	21 36.35	1.923	14 47 57.82	125.57	17 58 33.9	387.7	64.21	14 45.3	54 3.1	
10	U	9 59.64	1.958	15 13 17.36	127.69	19 9 58.6	325.4	64.74	14 45.8	54 5.2	I. N.
10	L	22 23.35	1.992	15 39 1.98	129.72	20 8 23.3	257.9	65.25	14 46.9	54 9.0	
11	U	10 47.44	2.023	16 5 10.03	131.57	−20 52 48.0	−185.5	65.70	14 48.3	54 14.4	I. N.*S.*
11	L	23 11.88	2.049	16 31 38.54	133.13	21 22 19.7	109.1	66.08	14 50.2	54 21.2	
12	U	11 36.59	2.068	16 58 23.46	134.29	21 36 16.0	− 29.8	66.37	14 52.4	54 29.3	I. N.*S.*
13	L	0 1.49	2.081	17 25 19.84	135.03	21 34 7.3	+ 51.5	66.56	14 54.9	54 38.6	
13	U	12 26.49	2.085	17 52 22.30	135.31	−21 15 38.1	+133.4	66.64	14 57.8	54 49.0	II. N.*S.*
14	L	0 51.50	2.082	18 19 25.41	135.14	20 40 49.6	214.5	66.61	15 0.9	55 0.4	
14	U	13 16.44	2.073	18 46 24.12	134.59	19 49 58.8	293.5	66.48	15 4.2	55 12.7	II. N.
15	L	1 41.24	2.059	19 13 14.25	133.73	18 43 38.0	369.3	66.28	15 7.8	55 25.9	
15	U	14 5.84	2.041	19 39 52.71	132.66	−17 22 33.4	+440.7	66.03	15 11.7	55 40.0	II. N.
16	L	2 30.22	2.022	20 6 17.75	131.50	15 47 43.3	506.7	65.76	15 15.7	55 54.9	
16	U	14 54.37	2.004	20 32 29.10	130.40	14 0 15.2	566.9	65.50	15 20.0	56 10.7	II. N.
17	L	3 18.32	1.988	20 58 27.94	129.45	12 1 24.7	620.4	65.28	15 24.5	56 27.3	
17	U	15 42.10	1.976	21 24 16.79	128.75	− 9 52 33.4	+666.9	65.13	15 29.3	56 44.7	II. N.
18	L	4 5.77	1.971	21 49 59.43	128.42	7 35 8.1	706.0	65.08	15 34.3	57 2.9	
18	U	16 29.42	1.973	22 15 40.67	128.54	5 10 40.5	737.2	65.13	15 39.4	57 21.8	II. N.
19	L	4 53.14	1.983	22 41 26.30	129.16	2 40 47.1	760.2	65.31	15 44.7	57 41.3	
19	U	17 17.05	2.003	23 7 22.82	130.36	− 0 7 11.2	+774.3	65.63	15 50.1	58 1.2	II. N.
20	L	5 41.25	2.033	23 33 37.22	132.15	+ 2 28 17.2	778.8	66.10	15 55.6	58 21.3	
20	U	18 5.87	2.073	0 0 16.80	134.55	5 3 38.1	772.9	66.73	16 1.1	58 41.4	II. N.
21	L	6 31.03	2.123	0 27 28.84	137.56	7 36 41.1	755.6	67.49	16 6.5	59 1.2	
21	U	18 56.85	2.182	0 55 20.28	141.10	+10 5 3.3	+725.9	68.37	16 11.7	59 20.2	II. N.
22	L	7 23.42	2.248	1 23 57.14	145.10	12 26 9.4	682.8	69.35	16 16.5	59 38.0	
22	U	19 50.82	2.319	1 53 23.97	149.40	14 37 12.6	625.3	70.39	16 20.9	59 54.1	II. N.
23	L	8 19.09	2.392	2 23 43.10	153.78	16 35 17.8	553.1	71.42	16 24.7	60 8.0	
23	U	20 48.22	2.462	2 54 53.87	157.96	+18 17 28.1	+466.3	72.39	16 27.7	60 19.2	II. N.
24	L	9 18.14	2.523	3 26 52.07	161.63	19 40 54.2	365.9	73.24	16 29.9	60 27.2	
24	U	21 48.70	2.569	3 59 29.41	164.43	20 43 6.1	254.3	73.87	16 31.1	60 31.6	II. N.
25	L	10 19.72	2.597	4 32 33.87	166.10	21 22 6.1	134.7	74.23	16 31.2	60 32.0	
25	U	22 50.94	2.602	5 5 50.33	166.41	+21 36 42.3	+ 11.1	74.29	16 30.2	60 28.2	II. N.
26	L	11 22.08	2.584	5 39 2.04	165.30	21 26 35.2	−111.8	74.02	16 28.0	60 20.2	
26	U	23 52.86	2.543	6 11 52.37	162.87	20 52 21.9	229.3	73.44	16 24.7	60 8.1	
27	L	12 23.04	2.484	6 44 6.49	159.32	19 55 30.4	337.5	72.60	16 20.4	59 52.3	
28	U	0 52.43	2.411	7 15 32.68	154.94	+18 38 10.7	−433.5	71.56	16 15.2	59 33.1	
28	L	13 20.88	2.331	7 46 3.08	150.08	17 3 1.2	515.6	70.40	16 9.2	59 11.1	
29	U	1 48.35	2.247	8 15 33.77	145.04	15 12 54.8	583.0	69.18	16 2.6	58 46.9	I. N.
29	L	14 14.81	2.165	8 44 4.24	140.09	13 10 47.1	635.9	67.97	15 55.6	58 21.1	
30	U	2 40.32	2.087	9 11 36.94	135.43	+10 59 26.9	−675.3	66.82	15 48.3	57 54.4	I. N.
30	L	15 4.94	2.017	9 38 16.41	131.23	8 41 30.5	702.2	65.77	15 40.9	57 27.4	
uly 1	U	3 28.77	1.956	10 4 8.60	127.56	6 19 18.6	718.1	64.85	15 33.7	57 0.8	I. N.
1	L	15 51.93	1.905	10 29 20.32	124.49	3 54 55.2	724.2	64.07	15 26.7	56 35.0	
2	U	4 14.54	1.864	10 53 58.86	122.03	+ 1 30 9.4	−722.0	63.43	15 20.0	56 10.5	I. N.

June 11, U Defective Illumination of *S*. 0″.62.
June 12, U Defective Illumination of *S*. 0″.05.
June 13, U Defective Illumination of *S*. 0″.35.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 2	U	4 14.54	1.864	10 53 58.86	122.03	+ 1 30 9.4	−722.0	63.43	15 20.0	56 10.5	I. N.
2	L	16 36.72	1.834	11 18 11.60	120.19	− 0 53 24.2	712.4	62.95	15 13.7	55 47.6	
3	U	4 58.59	1.813	11 42 5.86	118.95	3 14 21.7	696.2	62.64	15 8.1	55 26.8	I. N.
3	L	17 20.27	1.802	12 5 48.69	118.28	5 31 29.0	674.1	62.47	15 3.0	55 8.2	
4	U	5 41.88	1.800	12 29 26.84	118.16	− 7 43 37.7	−646.4	62.44	14 58.6	54 52.1	I. N.
4	L	18 3.51	1.806	12 53 6.55	118.54	9 49 44.0	613.7	62.54	14 54.9	54 38.6	
5	U	6 25.27	1.820	13 16 53.62	119.37	11 48 46.4	575.9	62.77	14 52.0	54 27.7	I. N.
5	L	18 47.23	1.841	13 40 53.18	120.61	13 39 44.4	532.9	63.09	14 49.7	54 19.4	
6	U	7 9.47	1.867	14 5 9.63	122.18	−15 21 37.3	−485.0	63.49	14 48.2	54 13.8	I. N.
6	L	19 32.05	1.897	14 29 46.54	124.02	16 53 23.4	431.9	63.95	14 47.4	54 10.8	
7	U	7 55.02	1.930	14 54 46.46	126.00	18 14 0.5	373.5	64.45	14 47.2	54 10.3	I. N.
7	L	20 18.39	1.965	15 20 10.83	128.06	19 22 26.9	310.0	64.97	14 47.7	54 12.2	
8	U	8 42.17	1.998	15 45 59.83	130.09	−20 17 41.9	−241.7	65.47	14 48.9	54 16.4	I. N.
8	L	21 6.34	2.030	16 12 12.38	131.97	20 58 48.3	168.7	65.92	14 50.6	54 22.6	
9	U	9 30.86	2.057	16 38 46.09	133.60	21 24 54.9	91.7	66.30	14 52.8	54 30.7	I. N.
9	L	21 55.68	2.078	17 5 37.41	134.89	21 35 19.4	− 11.8	66.60	14 55.4	54 40.4	
10	U	10 20.71	2.093	17 32 41.86	135.78	−21 29 30.8	+ 70.2	66.80	14 58.5	54 51.6	I. N.*S.*
10	L	22 45.88	2.101	17 59 54.35	136.23	21 7 12.1	153.0	66.89	15 1.9	55 4.1	
11	U	11 11.09	2.101	18 27 9.59	136.24	20 28 22.1	235.2	66.87	15 5.5	55 17.6	I. N.*S.*
11	L	23 36.27	2.094	18 54 22.51	135.85	19 33 16.6	315.4	66.76	15 9.4	55 31.9	
12	U	12 1.33	2.082	19 21 28.70	135.13	−18 22 27.5	+392.2	66.58	15 13.5	55 46.7	I. *II.* N.*S.*
13	L	0 26.23	2.066	19 48 24.76	134.18	16 56 42.7	464.4	66.34	15 17.7	56 2.0	
13	U	12 50.92	2.049	20 15 8.51	133.10	15 17 5.0	530.8	66.07	15 21.9	56 17.6	II. N.
14	L	1 15.39	2.031	20 41 39.10	132.01	13 24 49.4	590.6	65.80	15 26.1	56 33.2	
14	U	13 39.65	2.014	21 7 57.12	131.02	−11 21 20.2	+642.9	65.57	15 30.4	56 48.8	II. N.
15	L	2 3.74	2.001	21 34 4.52	130.25	9 8 10.6	687.2	65.39	15 34.6	57 4.2	
15	U	14 27.70	1.993	22 0 4.43	129.79	6 47 0.6	722.9	65.29	15 38.7	57 19.4	II. N.
16	L	2 51.60	1.992	22 26 1.03	129.72	4 19 35.4	749.7	65.30	15 42.8	57 34.4	
16	U	15 15.54	1.999	22 51 59.42	130.10	− 1 47 44.7	+767.2	65.43	15 46.8	57 49.0	II. N.
17	L	3 39.60	2.013	23 18 5.41	130.99	+ 0 46 36.9	774.8	65.69	15 50.7	58 3.3	
17	U	16 3.90	2.037	23 44 25.21	132.41	3 21 29.8	772.3	66.08	15 54.5	58 17.1	II. N.
18	L	4 28.53	2.070	0 11 5.35	134.37	5 54 49.4	759.1	66.61	15 58.1	58 30.4	
18	U	16 53.60	2.111	0 38 12.28	136.86	+ 8 24 24.6	+734.8	67.26	16 1.6	58 43.2	II. N.
19	L	5 19.22	2.160	1 5 52.04	139.84	10 47 58.1	698.8	68.03	16 4.9	58 55.3	
19	U	17 45.48	2.216	1 34 9.90	143.20	13 3 6.2	650.5	68.88	16 8.0	59 6.6	II. N.
20	L	6 12.43	2.276	2 3 9.79	146.81	15 7 20.2	589.7	69.77	16 10.8	59 16.8	
20	U	18 40.12	2.338	2 32 53.76	150.51	+16 58 8.7	+516.3	70.67	16 13.2	59 25.7	II. N.
21	L	7 8.53	2.397	3 3 21.43	154.06	18 33 2.7	430.7	71.52	16 15.2	59 33.2	
21	U	19 37.61	2.449	3 34 29.51	157.20	19 49 41.6	334.0	72.25	16 16.8	59 38.9	II. N.
22	L	8 7.26	2.490	4 6 11.51	159.66	20 46 2.1	228.0	72.81	16 17.8	59 42.6	
22	U	20 37.31	2.516	4 38 17.87	161.22	+21 20 27.6	+115.3	73.14	16 18.1	59 43.9	II. N.
23	L	9 7.57	2.524	5 10 36.56	161.70	21 31 56.6	− 0.7	73.22	16 17.8	59 42.7	
23	U	21 37.81	2.512	5 42 54.02	161.01	21 20 9.8	116.6	73.03	16 16.7	59 38.8	II. N.
24	L	10 7.79	2.482	6 14 56.51	159.21	20 45 32.9	228.5	72.58	16 14.9	59 32.0	
24	U	22 37.32	2.436	6 46 31.38	156.45	+19 49 14.9	−332.9	71.90	16 12.3	59 22.4	II. N.

July 10, U Defective Illumination of *S.* 0″.44.
July 11, U Defective Illumination of *S.* 0″.19.

July 12, U Defective Illumination of *II.* 0″.60.
July 12, U Defective Illumination of *S.* 0″.33.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 24	U	22 37.32	2.436	6 46 31.38	156.45	+19 49 14.9	−332.9	71.90	16 12.3	59 22.4	II. N.
25	L	11 6.22	2.378	7 17 28.18	152.92	18 33 2.1	427.2	71.03	16 8.9	59 10.0	
25	U	23 34.36	2.311	7 47 39.36	148.88	16 59 9.1	509.4	70.03	16 4.8	58 55.0	
26	L	12 1.66	2.240	8 17 0.49	144.61	15 10 9.1	578.3	68.97	16 0.1	58 37.7	
27	U	0 28.11	2.169	8 45 30.11	140.33	+13 8 43.4	−633.7	67.91	15 54.8	58 18.4	
27	L	12 53.73	2.101	9 13 9.30	136.24	10 57 33.3	675.8	66.89	15 49.1	57 57.5	
28	U	1 18.55	2.038	9 40 1.14	132.47	8 39 13.8	705.4	65.94	15 43.1	57 35.5	I. N.
28	L	13 42.66	1.982	10 6 10.20	129.12	6 16 9.5	723.5	65.09	15 36.9	57 12.8	
29	U	2 6.16	1.935	10 31 42.01	126.26	+ 3 50 32.0	−731.1	64.37	15 30.7	56 50.0	I. N.
29	L	14 29.14	1.896	10 56 42.66	123.93	+ 1 24 19.5	729.4	63.78	15 24.6	56 27.4	
30	U	2 51.70	1.866	11 21 18.54	122.14	− 1 0 42.2	719.5	63.33	15 18.6	56 5.6	I. N.
30	L	15 13.96	1.845	11 45 36.07	120.88	3 22 59.9	702.3	63.02	15 13.0	55 45.0	
31	U	3 36.02	1.833	12 9 41.58	120.13	− 5 41 10.0	−678.4	62.85	15 7.8	55 25.9	I. N.
31	L	15 57.98	1.829	12 33 41.11	119.87	7 53 57.5	648.6	62.81	15 3.1	55 8.7	
Aug. 1	U	4 19.94	1.832	12 57 40.37	120.08	10 0 13.5	613.2	62.89	14 59.0	54 53.5	I. N.
1	L	16 41.98	1.842	13 21 44.66	120.70	11 58 54.3	572.7	63.08	14 55.5	54 40.7	
2	U	5 4.18	1.859	13 45 58.70	121.69	−13 48 58.5	−527.2	63.36	14 52.7	54 30.4	I. N.
2	L	17 26.61	1.881	14 10 26.61	123.00	15 29 27.8	476.9	63.72	14 50.6	54 22.7	
3	U	5 49.33	1.907	14 35 11.76	124.56	16 59 24.1	421.7	64.13	14 49.2	54 17.7	I. N.
3	L	18 12.38	1.935	15 0 16.67	126.29	18 17 50.9	361.9	64.58	14 48.6	54 15.5	
4	U	6 35.78	1.965	15 25 42.90	128.10	−19 23 52.7	−297.5	65.05	14 48.8	54 16.0	I. N.
4	L	18 59.54	1.995	15 51 30.97	129.91	20 16 35.4	228.8	65.50	14 49.6	54 19.2	
5	U	7 23.66	2.024	16 17 40.31	131.63	20 55 8.6	156.1	65.92	14 51.2	54 25.0	I. N.
5	L	19 48.11	2.050	16 44 9.26	133.16	21 18 46.8	79.7	66.30	14 53.5	54 33.3	
6	U	8 12.83	2.071	17 10 55.19	134.44	−21 26 51.3	− 0.6	66.60	14 56.4	54 43.9	I. N.
6	L	20 37.78	2.087	17 37 54.63	135.41	21 18 52.9	+ 80.6	66.82	14 59.8	54 56.5	
7	U	9 2.89	2.097	18 5 3.55	136.02	20 54 33.7	162.7	66.94	15 3.8	55 11.0	I. N.*S*.
7	L	21 28.09	2.101	18 32 17.67	136.28	20 13 49.4	244.6	66.97	15 8.2	55 27.1	
8	U	9 53.30	2.100	18 59 32.79	136.20	−19 16 50.7	+324.9	66.92	15 12.9	55 44.4	I. *N*.S.
8	L	22 18.47	2.094	19 26 45.22	135.84	18 4 3.6	402.4	66.79	15 17.9	56 2.7	
9	U	10 43.54	2.084	19 53 51.99	135.26	16 36 10.3	475.6	66.62	15 23.0	56 21.6	I. *N*.S.
9	L	23 8.48	2.073	20 20 51.08	134.57	14 54 8.0	543.6	66.43	15 28.2	56 40.7	
10	U	11 33.29	2.061	20 47 41.69	133.86	−12 59 9.0	+605.1	66.23	15 33.4	56 59.7	I. N.*S*.
10	L	23 57.96	2.051	21 14 24.16	133.23	10 52 38.1	658.8	66.06	15 38.4	57 18.3	
11	U	12 22.52	2.043	21 40 59.97	132.77	8 36 12.3	704.0	65.94	15 43.3	57 36.1	II. N.
12	L	0 47.01	2.040	22 7 31.71	132.57	6 11 39.1	739.9	65.90	15 47.9	57 52.9	
12	U	13 11.49	2.042	22 34 2.94	132.70	− 3 40 55.2	+765.7	65.95	15 52.1	58 8.4	II. N.
13	L	1 36.03	2.050	23 0 37.93	133.21	− 1 6 4.2	780.9	66.10	15 56.0	58 22.5	
13	U	14 0.72	2.066	23 27 21.58	134.14	+ 1 30 42.7	785.0	66.36	15 59.4	58 35.0	II. N.
14	L	2 25.64	2.089	23 54 19.10	135.52	4 7 9.5	777.5	66.74	16 2.3	58 45.9	
14	U	14 50.88	2.119	0 21 35.80	137.34	+ 6 40 55.3	+758.0	67.23	16 4.8	58 55.1	II. N.
15	L	3 16.52	2.156	0 49 16.78	139.55	9 9 35.7	726.5	67.82	16 6.9	59 2.6	
15	U	15 42.64	2.198	1 17 26.53	142.12	11 30 44.2	682.8	68.49	16 8.5	59 8.5	II. N.
16	L	4 9.30	2.245	1 46 8.65	144.93	13 41 53.5	626.7	69.22	16 9.7	59 12.9	
16	U	16 36.53	2.294	2 15 25.30	147.85	+15 40 38.8	+558.8	69.96	16 10.5	59 15.8	II. N.

Aug. 7, U Defective Illumination of *S*. 0″.07.
Aug. 8, U Defective Illumination of *N*. 0″.05.
Aug. 9, U Defective Illumination of N. 0″.01.
Aug. 10, U Defective Illumination of S. 0″.02.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Aug.16	U	16 36.53	2.294	2 15 25.30	147.85	+15 40 38.8	+558.8	69.96	16 10.5	59 15.8	II. N.
17	L	5 4.34	2.341	2 45 16.81	150.71	17 24 40.4	479.7	70.67	16 10.9	59 17.2	
17	U	17 32.70	2.384	3 15 41.33	153.32	18 51 49.0	390.2	71.31	16 10.9	59 17.3	II. N.
18	L	6 1.54	2.420	3 46 34.59	155.47	20 0 10.3	292.1	71.83	16 10.5	59 16.0	
18	U	18 30.74	2.445	4 17 49.89	156.96	+20 48 12.2	+187.4	72.18	16 9.8	59 13.5	II. N.
19	L	7 0.17	2.456	4 49 18.44	157.65	21 14 50.2	+ 78.5	72.33	16 8.8	59 9.6	
19	U	19 29.64	2.453	5 20 49.95	157.44	21 19 31.8	− 31.5	72.26	16 7.4	59 4.4	II. N.
20	L	7 58.98	2.435	5 52 13.48	156.33	21 2 20.2	139.8	71.96	16 5.6	58 57.9	
20	U	20 28.01	2.402	6 23 18.44	154.37	+20 23 53.3	−243.6	71.46	16 3.4	58 49.9	II. N.
21	L	8 56.58	2.357	6 53 55.47	151.70	19 25 22.1	340.3	70.78	16 0.9	58 40.6	
21	U	21 24.56	2.304	7 23 57.11	148.50	18 8 24.6	427.7	69.97	15 57.9	58 29.8	II. S.
22	L	9 51.87	2.246	7 53 18.25	144.98	16 35 0.4	504.5	69.07	15 54.6	58 17.6	
22	U	22 18.45	2.185	8 21 56.16	141.33	+14 47 22.4	−569.8	68.14	15 50.9	58 4.1	II. S.
23	L	10 44.31	2.125	8 49 50.31	137.72	12 47 51.5	623.3	67.21	15 46.9	57 49.3	
23	U	23 9.47	2.068	9 17 2.10	134.29	10 38 50.1	665.0	66.32	15 42.5	57 33.3	
24	L	11 33.97	2.016	9 43 34.43	131.16	8 22 37.6	695.2	65.50	15 37.9	57 16.3	
24	U	23 57.88	1.970	10 9 31.36	128.40	+ 6 1 28.1	−714.6	64.78	15 33.1	56 58.6	
25	L	12 21.28	1.931	10 34 57.63	126.06	3 37 27.5	723.9	64.17	15 28.2	56 40.5	
26	U	0 44.26	1.900	10 59 58.46	124.17	+ 1 12 32.9	723.8	63.68	15 23.2	56 22.2	
26	L	13 6.91	1.876	11 24 39.29	122.72	− 1 11 28.1	715.1	63.31	15 18.2	56 4.0	
27	U	1 29.32	1.859	11 49 5.58	121.73	− 3 32 57.1	−698.5	63.07	15 13.3	55 46.2	I. N.
27	L	13 51.57	1.850	12 13 22.63	121.18	5 50 23.5	674.8	62.95	15 8.7	55 29.2	
28	U	2 13.75	1.848	12 37 35.54	121.04	8 2 25.5	644.5	62.94	15 4.4	55 13.3	I. N.
28	L	14 35.95	1.852	13 1 49.04	121.27	10 7 47.3	608.1	63.03	15 0.4	54 58.7	
29	U	2 58.22	1.862	13 26 7.47	121.85	−12 5 19.0	−566.2	63.22	14 56.9	54 45.8	I. N.
29	L	15 20.64	1.876	13 50 34.63	122.72	13 53 55.4	519.0	63.48	14 53.9	54 34.8	
30	U	3 43.26	1.894	14 15 13.77	123.84	15 32 35.8	466.9	63.81	14 51.5	54 25.9	I. N.
30	L	16 6.12	1.916	14 40 7.42	125.13	17 0 22.9	410.2	64.18	14 49.7	54 19.4	
31	U	4 29.25	1.940	15 5 17.41	126.55	−18 16 22.4	−349.0	64.58	14 48.6	54 15.4	I. N.
31	L	16 52.67	1.964	15 30 44.81	128.02	19 19 44.1	283.9	64.98	14 48.2	54 14.0	
Sept.1	U	5 16.39	1.988	15 56 29.77	129.47	20 9 40.8	215.0	65.37	14 48.6	54 15.2	I. N.
1	L	17 40.38	2.011	16 22 31.68	130.83	20 45 30.1	142.7	65.73	14 49.7	54 19.3	
2	U	6 4.63	2.031	16 48 49.15	132.05	−21 6 34.9	− 67.7	66.05	14 51.6	54 26.2	I. N.
2	L	18 29.11	2.048	17 15 20.06	133.07	21 12 25.1	+ 9.6	66.31	14 54.2	54 35.7	
3	U	6 53.77	2.061	17 42 1.84	133.85	21 2 37.9	88.5	66.49	14 57.5	54 47.9	I. N.*S*.
3	L	19 18.56	2.070	18 8 51.60	134.39	20 36 59.9	168.0	66.61	15 1.5	55 2.7	
4	U	7 43.43	2.075	18 35 46.39	134.70	−19 55 28.4	+247.2	66.66	15 6.1	55 19.7	I. *N*.S.
4	L	20 8.34	2.076	19 2 43.42	134.78	18 58 11.7	325.3	66.65	15 11.3	55 38.8	
5	U	8 33.25	2.075	19 29 40.40	134.70	17 45 30.7	401.1	66.59	15 17.0	55 59.6	I. S.
5	L	20 58.14	2.072	19 56 35.67	134.50	16 17 58.9	473.5	66.51	15 23.1	56 21.9	
6	U	9 22.98	2.068	20 23 28.33	134.27	−14 36 23.8	+541.5	66.42	15 29.4	56 45.1	I. S.
6	L	21 47.77	2.065	20 50 18.45	134.09	12 41 45.6	603.8	66.34	15 35.9	57 8.9	
7	U	10 12.54	2.064	21 17 7.03	134.03	10 35 19.3	659.3	66.29	15 42.4	57 32.8	I. S.
7	L	22 37.32	2.066	21 43 55.96	134.16	8 18 33.4	706.9	66.30	15 48.8	57 56.2	
8	U	11 2.15	2.073	22 10 48.04	134.57	− 5 53 10.0	+745.3	66.39	15 54.9	58 18.5	I. *N*.S.

Sept. 3, U Defective Illumination of *S*. 0″.58.
***Sept. 4, U Defective* Illumination of *N*. 0″.51.**

Sept. 8, U Defective Illumination of *N*. 0″.02.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Sept. 8	U	11 2.15	2.073	22 10 48.04	134.57	− 5 53 10.0	+745.3	66.39	15 54.9	58 18.5	I. *N.*S.
8	L	23 27.09	2.085	22 37 46.76	135.28	3 21 5.3	773.6	66.56	16 0.6	58 39.4	
9	U	11 52.20	2.103	23 4 56.19	136.35	− 0 44 28.1	790.6	66.82	16 5.7	58 58.4	I. *II.* N.
10	L	0 17.57	2.127	23 32 20.77	137.81	+ 1 54 20.8	795.4	67.19	16 10.2	59 14.9	
10	U	12 43.27	2.157	0 0 5.05	139.64	+ 4 32 50.1	+787.2	67.67	16 14.0	59 28.7	II. N.
11	L	1 9.37	2.193	0 28 13.41	141.81	7 8 19.8	765.4	68.23	16 17.0	59 39.6	
11	U	13 35.93	2.234	0 56 49.68	144.28	9 38 4.6	729.6	68.86	16 19.1	59 47.4	II. N.
12	L	2 3.00	2.278	1 25 56.77	146.93	11 59 16.8	680.0	69.54	16 20.3	59 52.0	
12	U	14 30.61	2.323	1 55 36.26	149.65	+14 9 10.6	+616.8	70.24	16 20.8	59 53.6	II. N.
13	L	2 58.76	2.367	2 25 47.94	152.27	16 5 7.8	540.8	70.90	16 20.4	59 52.3	
13	U	15 27.40	2.406	2 56 29.48	154.59	17 44 43.6	453.4	71.49	16 19.3	59 48.3	II. N.
14	L	3 56.46	2.436	3 27 36.29	156.45	19 5 52.3	356.6	71.97	16 17.6	59 42.0	
14	U	16 25.83	2.456	3 59 1.55	157.64	+20 6 54.0	+252.7	72.28	16 15.3	59 33.6	II. N.
15	L	4 55.36	2.463	4 30 36.54	158.05	20 46 39.9	144.5	72.39	16 12.5	59 23.4	
15	U	17 24.89	2.455	5 2 11.23	157.59	21 4 35.1	+ 34.8	72.29	16 9.4	59 11.9	II. N.
16	L	5 54.24	2.433	5 33 35.19	156.26	21 0 40.6	− 73.4	71.98	16 6.0	58 59.3	
16	U	18 23.24	2.398	6 4 38.41	154.15	+20 35 31.8	−177.2	71.47	16 2.3	58 45.8	II. S.
17	L	6 51.75	2.352	6 35 12.18	151.38	19 50 14.2	274.5	70.79	15 58.5	58 31.7	
17	U	19 19.66	2.298	7 5 9.70	148.14	18 46 18.0	363.4	69.97	15 54.5	58 17.1	II. S.
18	L	7 46.89	2.240	7 34 26.40	144.61	17 25 32.0	442.6	69.07	15 50.4	58 2.3	
18	U	20 13.41	2.180	8 3 0.02	140.98	+15 49 56.1	−511.6	68.14	15 46.3	57 47.2	II. S.
19	L	8 39.21	2.120	8 30 50.31	137.42	14 1 36.9	569.8	67.21	15 42.2	57 32.0	
19	U	21 4.31	2.064	8 57 58.89	134.05	12 2 42.9	617.4	66.32	15 38.0	57 16.6	II. S.
20	L	9 28.77	2.013	9 24 28.76	130.98	9 55 20.5	654.6	65.50	15 33.8	57 1.2	
20	U	21 52.65	1.968	9 50 23.93	128.27	+ 7 41 32.3	−681.8	64.76	15 29.6	56 45.9	II. S.
21	L	10 16.04	1.930	10 15 49.09	125.98	5 23 16.0	699.4	64.13	15 25.4	56 30.5	
21	U	22 39.01	1.899	10 40 49.37	124.13	3 2 23.7	707.9	63.62	15 21.2	56 15.2	II. S.
22	L	11 1.65	1.876	11 5 30.04	122.72	+ 0 40 40.9	707.8	63.23	15 17.1	56 0.1	
22	U	23 24.06	1.860	11 29 56.34	121.74	− 1 40 12.2	−699.6	62.96	15 13.1	55 45.3	
23	L	11 46.31	1.850	11 54 13.38	121.17	3 58 41.0	683.9	62.80	15 9.2	55 30.8	
24	U	0 8.49	1.847	12 18 25.98	120.99	6 13 16.4	660.8	62.76	15 5.4	55 16.9	
24	L	12 30.67	1.850	12 42 38.58	121.17	8 22 34.7	631.0	62.82	15 1.8	55 3.7	
25	U	0 52.91	1.858	13 6 55.20	121.65	−10 25 16.4	−594.9	62.96	14 58.4	54 51.4	I. N.
25	L	13 15.28	1.871	13 31 19.30	122.40	12 20 7.4	552.7	63.18	14 55.4	54 40.1	
26	U	1 37.82	1.887	13 55 53.74	123.37	14 5 58.1	504.8	63.46	14 52.7	54 30.2	I. N.
26	L	14 0.57	1.905	14 20 40.72	124.48	15 41 43.3	451.8	63.79	14 50.4	54 21.8	
27	U	2 23.55	1.925	14 45 41.70	125.68	−17 6 23.2	−394.1	64.14	14 48.5	54 15.0	I. N.
27	L	14 46.78	1.946	15 10 57.39	126.93	18 19 2.8	331.9	64.50	14 47.2	54 10.1	
28	U	3 10.25	1.966	15 36 27.77	128.13	19 18 53.0	265.8	64.85	14 46.4	54 7.4	I. N.
28	L	15 33.95	1.984	16 2 12.03	129.23	20 5 11.1	196.7	65.17	14 46.3	54 6.9	
29	U	3 57.86	2.000	16 28 8.76	130.20	−20 37 21.2	−124.7	65.45	14 46.8	54 8.8	I. N.
29	L	16 21.94	2.013	16 54 16.04	130.99	20 54 54.8	− 50.6	65.68	14 48.0	54 13.2	
30	U	4 46.16	2.023	17 20 31.51	131.56	20 57 30.9	+ 24.8	65.85	14 49.9	54 20.3	I. N.
30	L	17 10.48	2.029	17 46 52.70	131.94	20 44 57.1	100.9	65.96	14 52.6	54 30.1	
Oct. 1	U	5 34.85	2.032	18 13 17.19	132.12	−20 17 10.0	+176.9	66.02	14 56.0	54 42.6	I. S.

Sept. 8, U Defective Illumination of *N.* 0″.02. **Sept. 9, U Defective Illumination of *II.* 0″.01.**

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Oct. 1	U	5 34.85	2.032	18 13 17.19	132.12	−20 17 10.0	+176.9	66.02	14 56.0	54 42.6	I. S.
1	L	17 59.24	2.033	18 39 42.81	132.13	19 34 14.0	252.2	66.03	15 0.2	54 57.8	
2	U	6 23.62	2.031	19 6 7.88	132.03	18 36 22.9	326.0	65.99	15 5.0	55 15.6	I. S.
2	L	18 47.97	2.028	19 32 31.35	131.88	17 23 59.0	397.5	65.94	15 10.5	55 35.9	
3	U	7 12.29	2.026	19 58 52.94	131.74	−15 57 33.9	+466.1	65.89	15 16.7	55 58.4	I. S.
3	L	19 36.59	2.025	20 25 13.25	131.67	14 17 48.3	530.9	65.85	15 23.4	56 22.9	
4	U	8 0.90	2.026	20 51 33.73	131.77	12 25 32.4	590.9	65.84	15 30.5	56 49.0	I. S.
4	L	20 25.24	2.032	21 17 56.70	132.10	10 21 47.9	645.4	65.89	15 37.9	57 16.4	
5	U	8 49.68	2.042	21 44 25.30	132.73	− 8 7 47.6	+693.4	66.02	15 45.6	57 44.4	I. S.
5	L	21 14.28	2.058	22 11 3.44	133.70	5 44 58.1	733.5	66.24	15 53.2	58 12.5	
6	U	9 39.11	2.081	22 37 55.56	135.06	3 15 0.3	764.5	66.55	16 0.7	58 40.1	I. S.
6	L	22 4.25	2.111	23 5 6.60	136.85	− 0 39 51.2	785.1	66.98	16 7.9	59 6.4	
7	U	10 29.79	2.148	23 32 41.70	139.07	+ 1 58 15.6	+793.9	67.52	16 14.6	59 30.9	I. S.
7	L	22 55.82	2.191	0 0 45.91	141.70	4 36 50.2	789.5	68.16	16 20.5	59 52.8	
8	U	11 22.41	2.241	0 29 23.91	144.69	7 13 5.9	770.6	68.89	16 25.6	60 11.4	I. N.*S.*
8	L	23 49.63	2.295	0 58 39.52	147.95	9 44 3.6	736.3	69.69	16 29.7	60 26.3	
9	U	12 17.51	2.351	1 28 35.18	151.33	+12 6 35.5	+686.2	70.52	16 32.6	60 37.0	II. N.
10	L	0 46.06	2.407	1 59 11.49	154.68	14 17 31.1	620.4	71.34	16 34.3	60 43.2	
10	U	13 15.26	2.458	2 30 26.53	157.76	16 13 45.5	539.6	72.10	16 34.8	60 44.9	II. N.
11	L	1 45.03	2.501	3 2 15.64	160.32	17 52 29.3	445.7	72.73	16 34.0	60 42.2	
11	U	14 15.23	2.531	3 34 31.23	162.14	+19 11 19.2	+341.1	73.18	16 32.1	60 35.3	II. N.
12	L	2 45.71	2.546	4 7 3.05	163.00	20 8 26.5	229.2	73.42	16 29.2	60 24.6	
12	U	15 16.25	2.542	4 39 38.90	162.79	20 42 45.4	+113.6	73.41	16 25.4	60 10.6	II. N.
13	L	3 46.64	2.520	5 12 5.70	161.49	20 53 56.4	− 1.6	73.13	16 20.8	59 53.8	
13	U	16 16.67	2.482	5 44 10.65	159.17	+20 42 24.2	−112.9	72.61	16 15.7	59 34.9	II. N.*S.*
14	L	4 46.15	2.429	6 15 42.49	156.01	20 9 14.2	217.4	71.88	16 10.1	59 14.5	
14	U	17 14.93	2.366	6 46 32.33	152.22	19 16 3.3	312.8	70.98	16 4.3	58 53.1	II. S.
15	L	5 42.91	2.297	7 16 34.15	148.05	18 4 50.9	397.5	69.97	15 58.3	58 31.2	
15	U	18 10.05	2.225	7 45 44.86	143.74	+16 37 48.4	−471.0	68.90	15 52.3	58 9.2	II. S.
16	L	6 36.33	2.155	8 14 4.10	139.50	14 57 12.9	533.0	67.83	15 46.4	57 47.5	
16	U	19 1.78	2.088	8 41 33.75	135.49	13 5 19.6	584.1	66.81	15 40.7	57 26.4	II. S.
17	L	7 26.47	2.028	9 8 17.39	131.85	11 4 18.0	624.6	65.85	15 35.1	57 6.0	
17	U	19 50.47	1.974	9 34 19.83	128.65	+ 8 56 10.9	−655.1	64.99	15 29.8	56 46.5	II. S.
18	L	8 13.88	1.928	9 59 46.74	125.93	6 42 52.5	676.5	64.24	15 24.7	56 28.0	
18	U	20 36.81	1.892	10 24 44.09	123.72	4 26 9.2	689.4	63.63	15 20.0	56 10.5	II. S.
19	L	8 59.34	1.865	10 49 18.05	122.03	+ 2 7 40.4	694.2	63.15	15 15.5	55 54.1	
19	U	21 21.58	1.845	11 13 34.74	120.84	− 0 11 0.7	−691.5	62.79	15 11.3	55 38.7	II. S.
20	L	9 43.64	1.833	11 37 40.02	120.13	2 28 26.0	681.5	62.57	15 7.4	55 24.4	
20	U	22 5.60	1.828	12 1 39.44	119.85	4 43 10.4	664.7	62.47	15 3.8	55 11.1	II. S.
21	L	10 27.55	1.830	12 25 38.08	119.99	6 53 53.1	641.2	62.48	15 0.4	54 58.7	
21	U	22 49.56	1.839	12 49 40.51	120.48	− 8 59 15.2	−611.4	62.59	14 57.3	54 47.4	
22	L	11 11.69	1.852	13 13 50.66	121.27	10 58 0.8	575.2	62.79	14 54.5	54 37.1	
22	U	23 34.01	1.869	13 38 11.77	122.29	12 48 55.7	533.0	63.06	14 52.0	54 27.9	
23	L	11 56.55	1.889	14 2 46.29	123.49	14 30 49.5	485.0	63.37	14 49.8	54 19.8	
24	U	0 19.35	1.910	14 27 35.84	124.78	−16 2 34.8	−431.6	63.72	14 47.9	54 12.9	

Oct. 8, U Defective Illumination of *S.* 0″.04. **Oct. 13, U Defective Illumination of *S.* 0″.00.**

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Oct. 24	U	0 19.35	1.910	14 27 35.84	124.78	−16 2 34.8	−431.6	63.72	14 47.9	54 12.9	
24	L	12 42.40	1.932	14 52 41.14	126.10	17 23 9.0	373.3	64.09	14 46.4	54 7.2	
25	U	1 5.71	1.953	15 18 1.99	127.36	18 31 35.0	310.4	64.44	14 45.2	54 2.9	I. N.
25	L	13 29.27	1.972	15 43 37.30	128.50	19 27 2.6	243.6	64.76	14 44.4	54 0.1	
26	U	1 53.03	1.988	16 9 25.20	129.45	−20 8 49.7	−173.7	65.04	14 44.1	53 59.0	I. N.
26	L	14 16.96	2.000	16 35 23.13	130.16	20 36 23.2	101.5	65.26	14 44.3	53 59.7	
27	U	2 41.00	2.007	17 1 28.08	130.61	20 49 19.3	− 27.7	65.41	14 45.0	54 2.3	I. N.
27	L	15 5.11	2.010	17 27 36.81	130.80	20 47 25.2	+ 46.8	65.50	14 46.3	54 7.0	
28	U	3 29.23	2.009	17 53 46.18	130.73	−20 30 37.6	+121.1	65.52	14 48.2	54 13.9	I. S.
28	L	15 53.31	2.004	18 19 53.34	130.44	19 59 3.5	194.4	65.48	14 50.7	54 23.1	
29	U	4 17.32	1.997	18 45 56.02	129.98	19 12 58.4	266.1	65.39	14 53.9	54 34.8	I. S.
29	L	16 41.23	1.988	19 11 52.70	129.45	18 12 46.5	335.5	65.27	14 57.8	54 49.0	
30	U	5 5.03	1.979	19 37 42.79	128.90	−16 58 58.6	+402.0	65.14	15 2.3	55 5.7	I. S.
30	L	17 28.72	1.971	20 3 26.68	128.43	15 32 12.7	465.1	65.03	15 7.5	55 24.8	
31	U	5 52.34	1.966	20 29 5.79	128.12	13 53 11.9	524.3	64.96	15 13.4	55 46.4	I. S.
31	L	18 15.91	1.965	20 54 42.55	128.05	12 2 46.0	579.2	64.94	15 19.9	56 10.3	
Nov. 1	U	6 39.51	1.969	21 20 20.31	128.30	−10 1 50.9	+629.1	64.99	15 27.0	56 36.2	I. S.
1	L	19 3.19	1.979	21 46 3.35	128.94	7 51 30.2	673.3	65.14	15 34.5	57 3.9	
2	U	7 27.04	1.997	22 11 56.69	130.03	5 32 56.0	711.1	65.40	15 42.4	57 33.0	I. S.
2	L	19 51.16	2.024	22 38 6.03	131.62	3 7 32.1	741.5	65.79	15 50.6	58 3.0	
3	U	8 15.65	2.059	23 4 37.57	133.74	− 0 36 55.1	+763.1	66.31	15 58.9	58 33.4	I. S.
3	L	20 40.61	2.103	23 31 37.79	136.40	+ 1 57 2.1	774.6	66.95	16 7.1	59 3.4	
4	U	9 6.16	2.156	23 59 13.24	139.60	4 32 9.2	774.5	67.73	16 15.0	59 32.3	I. S.
4	L	21 32.40	2.218	0 27 30.11	143.29	7 5 56.3	761.0	68.62	16 22.4	59 59.4	
5	U	9 59.41	2.286	0 56 33.81	147.39	+ 9 35 34.0	+732.6	69.60	16 29.0	60 23.8	I. S.
5	L	22 27.27	2.358	1 26 28.32	151.74	11 57 55.8	688.2	70.64	16 34.7	60 44.7	
6	U	10 56.01	2.431	1 57 15.52	156.13	14 9 42.7	626.8	71.68	16 39.2	61 1.3	I. *N.*S.
6	L	23 25.61	2.501	2 28 54.40	160.29	16 7 31.2	548.5	72.66	16 42.4	61 13.2	
7	U	11 55.99	2.561	3 1 20.42	163.93	+17 48 4.8	+454.5	73.51	16 44.2	61 19.7	II. N.*S.*
8	L	0 27.01	2.607	3 34 25.17	166.70	19 8 27.3	347.2	74.17	16 44.5	61 20.8	
8	U	12 58.47	2.634	4 7 56.43	168.30	20 6 18.5	230.0	74.56	16 43.3	61 16.5	II. N.*S.*
9	L	1 30.13	2.638	4 41 39.07	168.56	20 40 6.2	+107.4	74.64	16 40.7	61 6.9	
9	U	14 1.69	2.619	5 15 16.26	167.40	+20 49 14.5	− 15.7	74.40	16 36.8	60 52.5	II. N.*S.*
10	L	2 32.88	2.577	5 48 31.36	164.90	20 34 6.3	134.7	73.85	16 31.8	60 34.0	
10	U	15 3.46	2.517	6 21 9.48	161.28	19 55 56.8	245.4	73.04	16 25.8	60 12.0	II. S.
11	L	3 33.23	2.443	6 52 58.89	156.84	18 56 44.0	344.8	72.02	16 19.1	59 47.4	
11	U	16 2.06	2.361	7 23 51.74	151.91	+17 38 53.6	−431.4	70.86	16 11.9	59 20.9	II. S.
12	L	4 29.89	2.276	7 53 44.08	146.81	16 5 5.8	504.4	69.64	16 4.4	58 53.4	
12	U	16 56.70	2.193	8 22 35.51	141.80	14 18 3.6	563.8	68.42	15 56.8	58 25.5	II. S.
13	L	5 22.54	2.115	8 50 28.47	137.09	12 20 24.4	610.6	67.24	15 49.2	57 57.7	
13	U	17 47.49	2.044	9 17 27.51	132.84	+10 14 34.6	−645.9	66.16	15 41.8	57 30.7	II. S.
14	L	6 11.63	1.982	9 43 38.59	129.12	8 2 46.6	670.5	65.20	15 34.8	57 4.8	
14	U	18 35.10	1.930	10 9 8.51	125.98	5 47 0.0	685.8	64.37	15 28.1	56 40.2	II. S.
15	L	6 58.00	1.888	10 34 4.46	123.45	3 29 1.1	692.7	63.68	15 21.8	56 17.2	
15	U	19 20.45	1.856	10 58 33.71	121.53	+ 1 10 25.1	−692.1	63.14	15 16.0	55 56.0	II. S.

Nov. 6, U Defective Illumination of *N.* 0″.76.
Nov. 7, U Defective Illumination of *S.* 0″.12.
Nov. 8, U Defective Illumination of *S.* 0″.59.
Nov. 9, U Defective Illumination of S. 0″.[illegible]

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Nov. 15	U	19 20.45	1.856	10 58 33.71	121.53	+ 1 10 25.1	−692.1	63.14	15 16.0	55 56.0	II. S.
16	L	7 42.58	1.834	11 22 43.35	120.18	− 1 7 20.9	684.5	62.75	15 10.8	55 36.7	
16	U	20 4.49	1.821	11 46 40.17	119.38	3 22 57.2	670.5	62.51	15 6.0	55 19.2	II. S.
17	L	8 26.30	1.816	12 10 30.49	119.09	5 35 8.7	650.4	62.40	15 1.7	55 3.6	
17	U	20 48.10	1.819	12 34 20.15	119.27	− 7 42 43.3	−624.4	62.41	14 58.0	54 49.7	II. S.
18	L	9 9.97	1.828	12 58 14.35	119.84	9 44 31.1	592.6	62.53	14 54.7	54 37.6	
18	U	21 31.99	1.843	13 22 17.51	120.75	11 39 23.6	555.1	62.74	14 51.8	54 27.2	II. S.
19	L	9 54.22	1.863	13 46 33.34	121.93	13 26 12.9	512.1	63.03	14 49.4	54 18.4	
19	U	22 16.71	1.886	14 11 4.58	123.30	−15 3 52.2	−463.6	63.37	14 47.5	54 11.2	II. S.
20	L	10 39.49	1.910	14 35 52.98	124.78	16 31 16.8	409.7	63.74	14 45.9	54 5.4	
20	U	23 2.56	1.935	15 0 59.28	126.27	17 47 24.7	350.9	64.11	14 44.7	54 1.0	
21	L	11 25.92	1.958	15 26 23.06	127.68	18 51 18.5	287.4	64.47	14 43.8	53 57.9	
21	U	23 49.54	1.979	15 52 2.85	128.92	−19 42 7.1	−220.0	64.79	14 43.4	53 56.2	
22	L	12 13.39	1.996	16 17 56.17	129.92	20 19 7.4	149.5	65.06	14 43.3	53 55.9	
23	U	0 37.42	2.007	16 43 59.78	130.62	20 41 45.8	76.6	65.25	14 43.6	53 56.9	
23	L	13 1.55	2.013	17 10 9.79	130.98	20 49 40.2	− 2.3	65.36	14 44.2	53 59.3	
24	U	1 25.72	2.014	17 36 22.09	131.00	−20 42 40.7	+ 72.2	65.39	14 45.3	54 3.2	I. S.
24	L	13 49.85	2.009	18 2 32.57	130.70	20 20 49.1	146.1	65.34	14 46.8	54 8.7	
25	U	2 13.90	1.999	18 28 37.55	130.10	19 44 19.3	218.4	65.22	14 48.7	54 15.8	I. S.
25	L	14 37.80	1.985	18 54 34.06	129.29	18 53 36.1	288.3	65.05	14 51.2	54 24.7	
26	U	3 1.53	1.969	19 20 19.99	128.36	−17 49 13.9	+354.9	64.84	14 54.1	54 35.4	I. S.
26	L	15 25.07	1.953	19 45 54.40	127.38	16 31 54.4	417.7	64.62	14 57.5	54 48.0	
27	U	3 48.42	1.938	20 11 17.45	126.47	15 2 25.8	476.3	64.42	15 1.5	55 2.6	I. S.
27	L	16 11.60	1.926	20 36 30.44	125.73	13 21 41.4	530.3	64.25	15 6.0	55 19.3	
28	U	4 34.66	1.918	21 1 35.94	125.24	−11 30 38.2	+579.4	64.14	15 11.1	55 38.1	I. S.
28	L	16 57.65	1.915	21 26 37.47	125.08	9 30 17.0	623.2	64.12	15 16.8	55 58.9	
29	U	5 20.65	1.919	21 51 39.54	125.34	7 21 43.3	661.4	64.20	15 23.0	56 21.7	I. S.
29	L	17 43.75	1.932	22 16 47.58	126.08	5 6 6.6	693.6	64.40	15 29.7	56 46.3	
30	U	6 7.05	1.953	22 42 7.66	127.36	− 2 44 43.4	+719.1	64.74	15 36.9	57 12.6	I. S.
30	L	18 30.66	1.984	23 7 46.56	129.22	− 0 18 58.6	737.0	65.22	15 44.4	57 40.3	
Dec. 1	U	6 54.71	2.025	23 33 51.47	131.70	+ 2 9 32.0	746.5	65.85	15 52.2	58 8.9	I. S.
1	L	19 19.31	2.077	0 0 29.80	134.80	4 38 59.4	746.3	66.63	16 0.2	58 38.0	
2	U	7 44.59	2.138	0 27 48.97	138.50	+ 7 7 18.1	+734.8	67.54	16 8.1	59 7.1	I. S.
2	L	20 10.66	2.209	0 55 55.92	142.74	9 32 4.8	710.7	68.58	16 15.8	59 35.4	
3	U	8 37.63	2.287	1 24 56.62	147.43	11 50 37.9	672.3	69.71	16 23.1	60 2.1	I. S.
3	L	21 5.56	2.369	1 54 55.34	152.38	13 59 58.1	618.4	70.88	16 29.8	60 26.5	
4	U	9 34.48	2.452	2 25 53.85	157.35	+15 56 53.7	+548.1	72.04	16 35.6	60 47.8	I. S.
4	L	22 4.37	2.529	2 57 50.54	162.02	17 38 7.6	461.5	73.12	16 40.3	61 5.1	
5	U	10 35.13	2.596	3 30 39.68	166.03	19 0 29.7	359.8	74.04	16 43.7	61 17.7	I. S.
5	L	23 6.60	2.645	4 4 11.09	169.01	20 1 13.4	245.6	74.71	16 45.7	61 25.2	
6	U	11 38.53	2.672	4 38 10.43	170.64	+20 38 10.3	+122.7	75.08	16 46.2	61 27.1	I. *N.* S.
7	L	0 10.64	2.674	5 12 20.27	170.73	20 50 5.1	− 3.9	75.10	16 45.2	61 23.3	
7	U	12 42.60	2.649	5 46 21.78	169.26	20 36 44.9	128.8	74.77	16 42.7	61 13.9	II. *N.* S.
8	L	1 14.13	2.601	6 19 56.80	166.36	19 58 59.8	247.1	74.12	16 38.7	60 59.3	
8	U	13 44.96	2.534	6 52 49.75	162.30	+18 58 35.6	−354.7	73.19	16 33.4	60 40.1	II. S.

Dec. 6, U Defective Illumination of *N.* 0″.57. **Dec. 7, U Defective Illumination of *N.* 0″.96.**

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Dec. 9	L	2 14.89	2.453	7 24 48.87	157.46	+17 38 0.7	−448.6	72.07	16 27.1	60 17.0	
9	U	14 43.81	2.366	7 55 46.91	152.19	16 0 9.6	527.3	70.84	16 20.0	59 50.8	II. S.
10	L	3 11.66	2.277	8 25 40.87	146.82	14 8 7.5	590.5	69.57	16 12.3	59 22.4	
10	U	15 38.46	2.191	8 54 31.42	141.65	12 4 57.0	638.9	68.32	16 4.2	58 52.6	II. S.
11	L	4 4.26	2.111	9 22 22.15	136.88	+ 9 53 29.7	−673.5	67.15	15 55.9	58 22.1	
11	U	16 29.16	2.040	9 49 18.54	132.62	7 36 21.1	696.0	66.08	15 47.6	57 51.7	II. S.
12	L	4 53.27	1.979	10 15 27.38	128.96	5 15 49.1	707.7	65.15	15 39.5	57 22.1	
12	U	17 16.71	1.929	10 40 56.08	125.93	2 53 53.5	710.1	64.37	15 31.7	56 53.6	II. S.
13	L	5 39.62	1.890	11 5 52.35	123.55	+ 0 32 18.6	−704.4	63.75	15 24.4	56 26.8	
13	U	18 2.11	1.860	11 30 23.78	121.79	− 1 47 24.4	691.6	63.28	15 17.7	56 2.0	II. S.
14	L	6 24.31	1.841	11 54 37.68	120.63	4 3 55.4	672.4	62.96	15 11.5	55 39.3	
14	U	18 46.33	1.831	12 18 41.00	120.01	6 16 1.8	647.6	62.78	15 5.9	55 18.8	II. S.
15	L	7 8.28	1.829	12 42 40.09	119.91	− 8 22 36.9	−617.4	62.73	15 1.0	55 0.8	
15	U	19 30.26	1.835	13 6 40.74	120.26	10 22 37.2	581.9	62.80	14 56.7	54 45.2	II. S.
16	L	7 52.35	1.847	13 30 48.02	121.01	12 15 2.2	541.3	62.97	14 53.1	54 31.9	
16	U	20 14.62	1.865	13 55 6.19	122.07	13 58 51.6	496.0	63.22	14 50.1	54 21.0	II. S.
17	L	8 37.13	1.887	14 19 38.59	123.37	−15 33 6.4	−445.7	63.54	14 47.8	54 12.3	
17	U	20 59.91	1.911	14 44 27.61	124.82	16 56 48.7	390.6	63.89	14 46.0	54 5.8	II. S.
18	L	9 22.99	1.936	15 9 34.49	126.33	18 9 2.0	330.9	64.25	14 44.7	54 1.2	
18	U	21 46.37	1.960	15 34 59.32	127.80	19 8 52.9	266.9	64.60	14 44.0	53 58.6	II. S.
19	L	10 10.03	1.982	16 0 41.07	129.13	−19 55 32.4	−199.1	64.92	14 43.8	53 57.7	
19	U	22 33.93	2.001	16 26 37.55	130.24	20 28 18.7	128.1	65.18	14 44.0	53 58.4	II. S.
20	L	10 58.03	2.014	16 52 45.66	131.05	20 46 38.3	− 54.8	65.37	14 44.6	54 0.6	
20	U	23 22.26	2.022	17 19 1.47	131.52	20 50 8.3	+ 20.0	65.48	14 45.6	54 4.2	
21	L	11 46.54	2.024	17 45 20.71	131.63	−20 38 37.7	+ 95.1	65.50	14 46.9	54 9.2	
22	U	0 10.81	2.019	18 11 38.93	131.36	20 12 9.2	169.5	65.43	14 48.6	54 15.4	
22	L	12 34.99	2.009	18 37 51.97	130.77	19 30 58.2	242.0	65.28	14 50.6	54 22.7	
23	U	0 59.02	1.995	19 3 56.25	129.91	18 35 32.3	311.8	65.07	14 52.9	54 31.2	I. S.
23	L	13 22.86	1.978	19 29 49.02	128.87	−17 26 31.2	+377.8	64.82	14 55.6	54 40.9	
24	U	1 46.49	1.959	19 55 28.64	127.74	16 4 43.6	439.3	64.55	14 58.5	54 51.7	I. S.
24	L	14 9.89	1.941	20 20 54.66	126.61	14 31 6.8	495.9	64.29	15 1.8	55 3.8	
25	U	2 33.07	1.924	20 46 7.74	125.60	12 46 43.8	547.0	64.05	15 5.4	55 17.1	I. S.
25	L	14 56.07	1.910	21 11 9.85	124.79	−10 52 42.4	+592.2	63.87	15 9.4	55 31.6	
26	U	3 18.94	1.902	21 36 3.98	124.28	8 50 14.3	631.4	63.77	15 13.7	55 47.5	I. S.
26	L	15 41.74	1.900	22 0 54.14	124.15	6 40 34.3	664.2	63.77	15 18.4	56 4.7	
27	U	4 4.56	1.905	22 25 45.27	124.46	4 24 59.9	690.3	63.88	15 23.4	56 23.2	I. S.
27	L	16 27.49	1.918	22 50 43.02	125.27	− 2 4 52.8	+709.6	64.12	15 28.8	56 43.0	
28	U	4 50.63	1.941	23 15 53.73	126.63	+ 0 18 20.7	721.4	64.49	15 34.5	57 4.0	I. S.
28	L	17 14.10	1.973	23 41 24.20	128.56	2 43 7.8	725.0	65.02	15 40.6	57 26.2	
29	U	5 38.02	2.015	0 7 21.58	131.11	5 7 47.2	719.9	65.69	15 46.9	57 49.4	I. S.
29	L	18 2.51	2.067	0 33 53.12	134.25	+ 7 30 27.7	+705.0	66.50	15 53.4	58 13.2	
30	U	6 27.68	2.129	1 1 5.83	137.96	9 49 5.4	679.3	67.44	16 0.0	58 37.3	I. S.
30	L	18 53.65	2.199	1 29 6.13	142.16	12 1 23.5	641.6	68.48	16 6.5	59 1.3	
31	U	7 20.49	2.275	1 57 59.25	146.73	14 4 51.6	590.8	69.59	16 12.9	59 24.8	I. S.
31	L	19 48.26	2.354	2 27 48.60	151.49	+15 56 47.2	+526.1	70.73	16 19.0	59 47.0	

MERCURY, 1919.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 1	22 29	17 13 25.57	−20 30 46.5	9.8	3.7	0.26	Feb. 15	23 55	21 37 36.43	−16 23 23.3	6.3	2.4	0.17
2	22 27	17 16 9.68	20 41 45.4	9.5	3.6	0.26	16	23 58	21 44 29.67	15 48 39.3	6.3	2.4	0.17
3	22 27	17 19 16.76	20 53 18.2	9.3	3.5	0.25	18	0 1	21 51 23.62	15 12 29.7	6.3	2.4	0.17
4	22 26	17 22 44.56	21 5 12.5	9.1	3.5	0.25	19	0 4	21 58 18.29	14 34 54.6	6.3	2.4	0.17
5	22 26	17 26 31.02	21 17 16.7	8.9	3.4	0.24	20	0 7	22 5 13.62	13 55 54.8	6.3	2.4	0.17
6	22 26	17 30 34.30	−21 29 20.8	8.8	3.3	0.24	21	0 10	22 12 9.59	−13 15 30.8	6.4	2.4	0.17
7	22 26	17 34 52.73	21 41 15.7	8.6	3.3	0.23	22	0 13	22 19 6.16	12 33 4[illegible].5	6.4	2.4	0.17
8	22 27	17 39 24.84	21 52 52.9	8.4	3.2	0.23	23	0 16	22 26 3.30	11 50 34.2	6.4	2.4	0.17
9	22 28	17 44 9.33	22 4 5.6	8.3	3.2	0.23	24	0 19	22 33 0.91	11 6 4.3	6.4	2.4	0.17
10	22 29	17 49 5.00	22 14 47.1	8.1	3.1	0.22	25	0 22	22 39 58.90	10 20 15.6	6.5	2.5	0.17
11	22 30	17 54 10.81	−22 24 51.8	8.0	3.0	0.22	26	0 25	22 46 57.14	− 9 33 10.6	6.5	2.5	0.17
12	22 31	17 59 25.85	22 34 14.5	7.9	3.0	0.22	27	0 28	22 53 55.46	8 44 51.9	6.5	2.5	0.17
13	22 33	18 4 49.27	22 42 50.7	7.8	3.0	0.21	28	0 31	23 0 53.65	7 55 22.9	6.6	2.5	0.17
14	22 34	18 10 20.35	22 50 36.5	7.7	2.9	0.21	Mar. 1	0 34	23 7 51.42	7 4 47.9	6.6	2.5	0.17
15	22 36	18 15 58.40	22 57 28.2	7.6	2.9	0.21	2	0 37	23 14 48.44	6 13 11.7	6.7	2.5	0.17
16	22 38	18 21 42.84	−23 3 22.6	7.5	2.8	0.21	3	0 40	23 21 44.31	− 5 20 40.1	6.7	2.6	0.17
17	22 40	18 27 33.13	23 8 16.9	7.4	2.8	0.20	4	0 43	23 28 38.48	4 27 19.8	6.8	2.6	0.17
18	22 42	18 33 28.79	23 12 8.3	7.3	2.8	0.20	5	0 46	23 35 30.36	3 33 19.1	6.9	2.6	0.18
19	22 44	18 39 29.36	23 14 54.7	7.2	2.7	0.20	6	0 49	23 42 19.23	2 38 46.6	7.0	2.7	0.18
20	22 46	18 45 34.46	23 16 34.1	7.1	2.7	0.20	7	0 51	23 49 4.27	1 43 52.8	7.1	2.7	0.18
21	22 48	18 51 43.72	−23 17 4.4	7.1	2.7	0.19	8	0 54	23 55 44.49	− 0 48 49.3	7.2	2.7	0.18
22	22 50	18 57 56.79	23 16 23.8	7.0	2.7	0.19	9	0 57	0 2 18.81	+ 0 6 11.0	7.3	2.8	0.19
23	22 53	19 4 13.40	23 14 31.0	6.9	2.6	0.19	10	0 59	0 8 45.96	1 0 53.8	7.5	2.8	0.19
24	22 55	19 10 33.24	23 11 24.4	6.9	2.6	0.19	11	1 2	0 15 4.65	1 55 4.4	7.6	2.9	0.19
25	22 57	19 16 56.06	23 7 2.9	6.8	2.6	0.19	12	1 4	0 21 13.44	2 48 26.4	7.8	2.9	0.20
26	23 0	19 23 21.64	−23 1 25.4	6.8	2.6	0.19	13	1 6	0 27 10.74	+ 3 40 43.2	7.9	3.0	0.20
27	23 2	19 29 49.75	22 54 30.5	6.7	2.6	0.19	14	1 8	0 32 54.97	4 31 37.7	8.1	3.1	0.21
28	23 5	19 36 20.18	22 46 17.5	6.7	2.5	0.18	15	1 9	0 38 24.50	5 20 52.5	8.3	3.2	0.21
29	23 7	19 42 52.76	22 36 45.4	6.7	2.5	0.18	16	1 10	0 43 37.66	6 8 10.8	8.5	3.2	0.22
30	23 10	19 49 27.31	22 25 53.3	6.6	2.5	0.18	17	1 11	0 48 32.84	6 53 15.7	8.7	3.3	0.22
31	23 13	19 56 3.68	−22 13 40.8	6.6	2.5	0.18	18	1 12	0 53 8.45	+ 7 35 51.7	9.0	3.4	0.23
Feb. 1	23 15	20 2 41.73	22 0 6.8	6.5	2.5	0.18	19	1 12	0 57 23.04	8 15 43.7	9.2	3.5	0.24
2	23 18	20 9 21.31	21 45 10.9	6.5	2.5	0.18	20	1 12	1 1 15.21	8 52 37.9	9.5	3.6	0.24
3	23 21	20 16 2.33	21 28 52.6	6.5	2.5	0.18	21	1 12	1 4 43.75	9 26 21.4	9.8	3.7	0.25
4	23 24	20 22 44.64	21 11 11.1	6.4	2.4	0.17	22	1 11	1 7 47.59	9 56 42.8	10.1	3.8	0.26
5	23 26	20 29 28.19	−20 52 6.2	6.4	2.4	0.17	23	1 10	1 10 25.82	+10 23 31.7	10.4	4.0	0.27
6	23 29	20 36 12.86	20 31 37.2	6.4	2.4	0.17	24	1 8	1 12 37.78	10 46 39.0	10.8	4.1	0.28
7	23 32	20 42 58.60	20 9 43.8	6.4	2.4	0.17	25	1 6	1 14 22.96	11 5 56.9	11.1	4.2	0.29
8	23 35	20 49 45.33	19 46 25.7	6.4	2.4	0.17	26	1 3	1 15 41.19	11 21 18.8	11.4	4.3	0.29
9	23 38	20 56 32.98	19 21 42.4	6.3	2.4	0.17	27	1 0	1 16 32.48	11 32 39.6	11.8	4.5	0.30
10	23 41	21 3 21.53	−18 55 33.8	6.3	2.4	0.17	28	0 57	1 16 57.20	+11 39 55.8	12.1	4.6	0.31
11	23 43	21 10 10.94	18 27 59.6	6.3	2.4	0.17	29	0 53	1 16 55.99	11 43 6.0	12.5	4.7	0.32
12	23 46	21 17 1.15	17 58 59.6	6.3	2.4	0.17	30	0 48	1 16 29.86	11 42 10.6	12.8	4.9	0.33
13	23 49	21 23 52.14	17 28 33.4	6.3	2.4	0.17	31	0 43	1 15 40.12	11 37 12.9	13.1	5.0	0.34
14	23 52	21 30 43.91	16 56 41.3	6.3	2.4	0.17	Apr. 1	0 38	1 14 28.44	11 28 18.5	13.4	5.1	0.35
15	23 55	21 37 36.43	−16 23 23.3	6.3	2.4	0.17	2	0 33	1 12 56.89	+11 15 36.7	13.7	5.2	0.36
16	23 58	21 44 29.67	−15 48 39.3	6.3	2.4	0.17	3	0 27	1 11 7.81	+10 59 19.7	14.0	5.3	0.36

MERCURY, 1919.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	0 38	1 14 28.44	+11 28 18.5	13.4	5.1	0.35	May 16	22 27	2 4 6.42	+ 9 34 23.2	8.6	3.3	0.22
2	0 33	1 12 56.89	11 15 36.7	13.7	5.2	0.36	17	22 29	2 9 39.29	10 8 54.0	8.5	3.2	0.22
3	0 27	1 11 7.81	10 59 19.7	14.0	5.3	0.36	18	22 30	2 15 21.64	10 44 14.5	8.4	3.2	0.21
4	0 21	1 9 3.85	10 39 43.6	14.3	5.4	0.37	19	22 32	2 21 13.62	11 20 20.4	8.2	3.1	0.21
5	0 15	1 6 47.89	10 17 7.6	14.5	5.5	0.37	20	22 34	2 27 15.41	11 57 7.0	8.1	3.1	0.21
6	0 9	1 4 23.01	+ 9 51 54.2	14.7	5.6	0.38	21	22 37	2 33 27.23	+12 34 29.6	8.0	3.0	0.21
7	0 2	1 1 52.38	9 24 29.1	14.9	5.6	0.38	22	22 39	2 39 49.29	13 12 23.0	7.9	3.0	0.20
7	23 56	0 59 19.19	8 55 19.9	15.0	5.7	0.38	23	22 42	2 46 21.85	13 50 41.8	7.8	2.9	0.20
8	23 49	0 56 46.59	8 24 55.6	15.1	5.7	0.39	24	22 44	2 53 5.15	14 29 20.2	7.6	2.9	0.20
9	23 43	0 54 17.57	7 53 46.3	15.2	5.8	0.39	25	22 47	2 59 59.44	15 8 11.9	7.5	2.9	0.20
10	23 37	0 51 54.95	+ 7 22 21.3	15.2	5.8	0.39	26	22 50	3 7 4.97	+15 47 10.0	7.4	2.8	0.20
11	23 30	0 49 41.25	6 51 9.7	15.2	5.8	0.39	27	22 54	3 14 21.95	16 26 7.3	7.3	2.8	0.19
12	23 24	0 47 38.68	6 20 38.0	15.1	5.7	0.38	28	22 57	3 21 50.60	17 4 55.6	7.3	2.8	0.19
13	23 19	0 45 49.17	5 51 10.8	15.0	5.7	0.38	29	23 1	3 29 31.04	17 43 26.2	7.2	2.7	0.19
14	23 13	0 44 14.25	5 23 9.6	14.9	5.7	0.38	30	23 5	3 37 23.39	18 21 29.9	7.1	2.7	0.19
15	23 8	0 42 55.18	+ 4 56 53.2	14.8	5.6	0.38	31	23 9	3 45 27.63	+18 58 56.5	7.0	2.7	0.19
16	23 3	0 41 52.85	4 32 37.1	14.6	5.6	0.37	June 1	23 13	3 53 43.67	19 35 35.2	6.9	2.6	0.19
17	22 58	0 41 7.87	4 10 33.8	14.4	5.5	0.37	2	23 18	4 2 11.32	20 11 14.7	6.9	2.6	0.19
18	22 54	0 40 40.60	3 50 52.7	14.3	5.4	0.36	3	23 23	4 10 50.20	20 45 43.1	6.8	2.6	0.19
19	22 50	0 40 31.19	3 33 40.8	14.1	5.3	0.36	4	23 27	4 19 39.82	21 18 47.8	6.8	2.6	0.18
20	22 46	0 40 39.56	+ 3 19 2.1	13.8	5.3	0.35	5	23 32	4 28 39.50	+21 50 16.8	6.8	2.6	0.18
21	22 42	0 41 5.48	3 6 59.6	13.6	5.2	0.35	6	23 38	4 37 48.38	22 19 57.3	6.7	2.5	0.18
22	22 39	0 41 48.65	2 57 33.5	13.4	5.1	0.34	7	23 43	4 47 5.42	22 47 37.6	6.7	2.5	0.18
23	22 36	0 42 48.61	2 50 43.0	13.2	5.0	0.33	8	23 48	4 56 29.45	23 13 6.1	6.7	2.5	0.18
24	22 34	0 44 4.83	2 46 26.0	12.9	4.9	0.33	9	23 54	5 5 59.11	23 36 12.5	6.7	2.5	0.18
25	22 31	0 45 36.81	+ 2 44 39.8	12.7	4.8	0.32	10	23 59	5 15 32.94	+23 56 47.7	6.6	2.5	0.18
26	22 29	0 47 23.93	2 45 20.4	12.5	4.7	0.32	12	0 5	5 25 9.38	24 14 44.2	6.6	2.5	0.19
27	22 27	0 49 25.62	2 48 23.9	12.2	4.6	0.31	13	0 11	5 34 46.84	24 29 56.3	6.7	2.5	0.19
28	22 26	0 51 41.28	2 53 45.7	12.0	4.6	0.30	14	0 17	5 44 23.71	24 42 19.9	6.7	2.5	0.19
29	22 24	0 54 10.36	3 1 20.9	11.8	4.5	0.30	15	0 22	5 53 58.43	24 51 53.0	6.7	2.5	0.19
30	22 23	0 56 52.30	+ 3 11 4.7	11.6	4.4	0.29	16	0 28	6 3 29.48	+24 58 35.5	6.7	2.6	0.19
May 1	22 22	0 59 46.58	3 22 52.1	11.3	4.3	0.29	17	0 33	6 12 55.47	25 2 28.6	6.8	2.6	0.19
2	22 21	1 2 52.71	3 36 38.3	11.1	4.2	0.28	18	0 39	6 22 15.13	25 3 35.6	6.8	2.6	0.19
3	22 20	1 6 10.23	3 52 18.1	10.9	4.1	0.28	19	0 44	6 31 27.28	25 2 0.8	6.9	2.6	0.19
4	22 20	1 9 38.77	4 9 47.1	10.7	4.1	0.27	20	0 49	6 40 30.95	24 57 49.6	6.9	2.6	0.19
5	22 20	1 13 17.94	+ 4 29 0.4	10.5	4.0	0.27	21	0 54	6 49 25.27	+24 51 8.4	7.0	2.7	0.20
6	22 19	1 17 7.40	4 49 53.3	10.3	3.9	0.26	22	0 59	6 58 9.51	24 42 4.5	7.1	2.7	0.20
7	22 19	1 21 6.89	5 12 21.4	10.1	3.8	0.26	23	1 3	7 6 43.08	24 30 45.1	7.1	2.7	0.20
8	22 20	1 25 16.15	5 36 20.4	9.9	3.8	0.25	24	1 8	7 15 5.52	24 17 18.2	7.2	2.7	0.20
9	22 20	1 29 35.00	6 1 45.9	9.8	3.7	0.25	25	1 12	7 23 16.44	24 1 51.7	7.3	2.8	0.20
10	22 21	1 34 3.26	+ 6 28 33.9	9.6	3.6	0.24	26	1 16	7 31 15.58	+23 44 33.7	7.4	2.8	0.20
11	22 21	1 38 40.82	6 56 40.0	9.4	3.6	0.24	27	1 20	7 39 2.74	23 25 32.1	7.5	2.8	0.21
12	22 22	1 43 27.58	7 26 0.4	9.3	3.5	0.24	28	1 23	7 46 37.77	23 4 54.9	7.6	2.9	0.21
13	22 23	1 48 23.52	7 56 30.8	9.1	3.4	0.23	29	1 27	7 54 0.62	22 42 49.7	7.7	2.9	0.21
14	22 24	1 53 28.61	8 28 7.5	8.9	3.4	0.23	30	1 30	8 1 11.25	22 19 24.1	7.8	3.0	0.21
15	22 26	1 58 42.89	+ 9 0 46.2	8.8	3.3	0.23	July 1	1 33	8 8 9.64	+21 54 45.3	7.9	3.0	0.21
16	22 27	2 4 6.42	+ 9 34 23.2	8.6	3.3	0.22	2	1 36	8 14 55.82	+21 29 0.4	8.0	3.0	0.22

MERCURY, 1919.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	1 33	8 8 9.64	+21 54 45.3	7.9	3.0	0.21	Aug. 15	23 51	9 26 38.70	+10 21 50.4	14.2	5.4	0.37
2	1 36	8 14 55.82	21 29 0.4	8.0	3.0	0.22	16	23 44	9 23 50.69	10 45 57.8	14.0	5.3	0.36
3	1 39	8 21 29.84	21 2 16.1	8.1	3.1	0.22	17	23 37	9 21 15.40	11 10 36.5	13.8	5.3	0.36
4	1 41	8 27 51.72	20 34 39.2	8.2	3.1	0.22	18	23 31	9 18 56.30	11 35 23.0	13.6	5.2	0.35
5	1 43	8 34 1.52	20 6 15.9	8.4	3.2	0.22	19	23 25	9 16 56.59	11 59 53.9	13.3	5.1	0.35
6	1 45	8 39 59.32	+19 37 12.3	8.5	3.2	0.23	20	23 20	9 15 19.22	+12 23 47.0	13.1	5.0	0.34
7	1 47	8 45 45.13	19 7 34.4	8.6	3.3	0.23	21	23 14	9 14 6.75	12 46 40.3	12.8	4.8	0.33
8	1 49	8 51 18.99	18 37 28.3	8.7	3.3	0.23	22	23 10	9 13 21.40	13 8 13.1	12.4	4.7	0.32
9	1 50	8 56 40.92	18 6 59.4	8.9	3.4	0.24	23	23 6	9 13 4.95	13 28 6.6	12.1	4.6	0.32
10	1 51	9 1 50.92	17 36 13.3	9.0	3.4	0.24	24	23 2	9 13 18.73	13 46 3.3	11.8	4.5	0.31
11	1 52	9 6 48.94	+17 5 15.7	9.2	3.5	0.24	25	22 59	9 14 3.69	+14 1 47.3	11.5	4.3	0.30
12	1 53	9 11 34.97	16 34 11.9	9.3	3.5	0.25	26	22 56	9 15 20.33	14 15 4.5	11.1	4.2	0.29
13	1 54	9 16 8.91	16 3 7.2	9.5	3.6	0.25	27	22 54	9 17 8.79	14 25 41.9	10.8	4.1	0.28
14	1 54	9 20 30.69	15 32 7.1	9.6	3.7	0.25	28	22 52	9 19 28.80	14 33 28.5	10.5	4.0	0.27
15	1 54	9 24 40.15	15 1 17.1	9.8	3.7	0.26	29	22 51	9 22 19.74	14 38 14.8	10.2	3.9	0.27
16	1 54	9 28 37.16	+14 30 42.4	10.0	3.8	0.26	30	22 51	9 25 40.68	+14 39 52.6	9.9	3.7	0.26
17	1 54	9 32 21.51	14 0 28.9	10.2	3.9	0.26	31	22 50	9 29 30.36	14 38 15.9	9.6	3.6	0.25
18	1 54	9 35 52.96	13 30 41.9	10.3	3.9	0.27	Sept. 1	22 51	9 33 47.23	14 33 20.3	9.3	3.5	0.24
19	1 53	9 39 11.27	13 1 27.6	10.5	4.0	0.27	2	22 52	9 38 29.54	14 25 3.3	9.0	3.4	0.24
20	1 52	9 42 16.15	12 32 51.6	10.7	4.1	0.28	3	22 53	9 43 35.27	14 13 24.5	8.8	3.3	0.23
21	1 51	9 45 7.25	+12 5 0.2	10.9	4.1	0.28	4	22 54	9 49 2.30	+13 58 25.4	8.5	3.2	0.22
22	1 50	9 47 44.21	11 37 59.7	11.1	4.2	0.29	5	22 56	9 54 48.34	13 40 9.9	8.3	3.2	0.22
23	1 48	9 50 6.64	11 11 56.9	11.3	4.3	0.29	6	22 58	10 0 51.10	13 18 43.8	8.1	3.1	0.21
24	1 46	9 52 14.10	10 46 58.5	11.5	4.4	0.30	7	23 0	10 7 8.19	12 54 14.8	7.9	3.0	0.21
25	1 44	9 54 6.14	10 23 11.7	11.7	4.5	0.30	8	23 3	10 13 37.32	12 26 52.2	7.7	2.9	0.20
26	1 42	9 55 42.30	+10 0 43.8	11.9	4.5	0.31	9	23 6	10 20 16.27	+11 56 46.8	7.6	2.9	0.20
27	1 39	9 57 2.08	9 39 42.6	12.1	4.6	0.31	10	23 9	10 27 2.96	11 24 10.8	7.4	2.8	0.19
28	1 37	9 58 5.01	9 20 15.8	12.4	4.7	0.32	11	23 11	10 33 55.45	10 49 16.7	7.3	2.8	0.19
29	1 33	9 58 50.60	9 2 31.7	12.6	4.8	0.32	12	23 14	10 40 52.00	10 12 17.7	7.2	2.7	0.18
30	1 30	9 59 18.42	8 46 38.5	12.8	4.9	0.33	13	23 17	10 47 51.07	9 33 27.0	7.1	2.7	0.18
31	1 26	9 59 28.09	+ 8 32 44.6	13.0	4.9	0.33	14	23 21	10 54 51.31	+ 8 52 57.6	7.0	2.6	0.18
Aug. 1	1 22	9 59 19.28	8 20 57.7	13.2	5.0	0.34	15	23 24	11 1 51.59	8 11 2.1	6.9	2.6	0.17
2	1 18	9 58 51.80	8 11 26.2	13.4	5.1	0.34	16	23 27	11 8 50.94	7 27 52.6	6.8	2.6	0.17
3	1 13	9 58 5.57	8 4 17.2	13.6	5.2	0.35	17	23 30	11 15 48.61	6 43 40.5	6.7	2.5	0.17
4	1 8	9 57 0.67	7 59 37.7	13.8	5.2	0.35	18	23 33	11 22 43.97	5 58 36.3	6.6	2.5	0.17
5	1 3	9 55 37.42	+ 7 57 33.4	14.0	5.3	0.36	19	23 36	11 29 36.56	+ 5 12 49.8	6.6	2.5	0.17
6	0 57	9 53 56.37	7 58 9.0	14.1	5.4	0.36	20	23 38	11 36 26.01	4 26 29.7	6.5	2.5	0.17
7	0 51	9 51 58.34	8 1 27.6	14.3	5.4	0.36	21	23 41	11 43 12.09	3 39 44.4	6.5	2.5	0.16
8	0 45	9 49 44.48	8 7 29.9	14.4	5.4	0.37	22	23 44	11 49 54.63	2 52 41.0	6.4	2.4	0.16
9	0 39	9 47 16.32	8 16 14.7	14.5	5.5	0.37	23	23 47	11 56 33.57	2 5 26.0	6.4	2.4	0.16
10	0 32	9 44 35.69	+ 8 27 38.2	14.5	5.5	0.37	24	23 49	12 3 8.89	+ 1 18 5.5	6.4	2.4	0.16
11	0 25	9 41 44.83	8 41 33.6	14.6	5.5	0.37	25	23 52	12 9 40.61	+ 0 30 44.6	6.3	2.4	0.16
12	0 18	9 38 46.37	8 57 51.2	14.6	5.5	0.37	26	23 54	12 16 8.81	− 0 16 31.9	6.3	2.4	0.16
13	0 11	9 35 43.20	9 16 18.4	14.5	5.5	0.37	27	23 57	12 22 33.59	1 3 39.7	6.3	2.4	0.16
14	0 4	9 32 38.55	9 36 39.7	14.5	5.5	0.37	28	23 59	12 28 55.07	1 50 35.1	6.3	2.4	0.16
14	23 57	9 29 35.87	+ 9 58 37.0	14.4	5.4	0.37	30	0 2	12 35 13.41	− 2 37 14.7	6.2	2.4	0.16
15	23 51	9 26 38.70	+10 21 50.4	14.2	5.4	0.37	Oct. 1	0 4	12 41 28.75	− 3 23 35.5	6.2	2.4	0.16

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	0 4	12 41 28.75	− 3 23 35.5	6.2	2.4	0.16	Nov. 16	1 17	16 55 56.91	−25 11 34.2	9.4	3.6	0.26
2	0 6	12 47 41.29	4 9 34.7	6.2	2.4	0.16	17	1 16	16 59 2.73	25 11 31.5	9.6	3.7	0.27
3	0 8	12 53 51.16	4 55 9.9	6.2	2.4	0.16	18	1 15	17 1 43.65	25 9 36.4	9.9	3.7	0.28
4	0 11	12 59 58.57	5 40 18.9	6.2	2.4	0.16	19	1 13	17 3 56.61	25 5 44.6	10.1	3.8	0.28
5	0 13	13 6 3.67	6 24 59.5	6.2	2.4	0.16	20	1 11	17 5 38.41	24 59 50.8	10.4	3.9	0.29
6	0 15	13 12 6.66	− 7 9 9.9	6.2	2.4	0.16	21	1 8	17 6 45.77	−24 51 49.8	10.6	4.0	0.30
7	0 17	13 18 7.70	7 52 48.3	6.2	2.4	0.16	22	1 5	17 7 15.46	24 41 35.5	10.9	4.1	0.30
8	0 19	13 24 6.96	8 35 53.4	6.2	2.4	0.16	23	1 0	17 7 4.46	24 29 1.9	11.2	4.3	0.31
9	0 21	13 30 4.60	9 18 23.3	6.3	2.4	0.16	24	0 56	17 6 10.21	24 14 3.3	11.5	4.4	0.32
10	0 23	13 36 0.78	10 0 16.8	6.3	2.4	0.16	25	0 50	17 4 30.93	23 56 34.8	11.8	4.5	0.33
11	0 25	13 41 55.65	−10 41 32.5	6.3	2.4	0.16	26	0 44	17 2 5.94	−23 36 33.6	12.0	4.6	0.33
12	0 27	13 47 49.35	11 22 9.0	6.3	2.4	0.16	27	0 37	16 58 56.04	23 14 0.2	12.3	4.7	0.34
13	0 29	13 53 42.03	12 2 5.3	6.3	2.4	0.16	28	0 29	16 55 3.85	22 49 0.7	12.5	4.7	0.34
14	0 31	13 59 33.80	12 41 20.0	6.3	2.4	0.17	29	0 20	16 50 34.03	22 21 48.1	12.7	4.8	0.35
15	0 33	14 5 24.75	13 19 51.7	6.4	2.4	0.17	30	0 11	16 45 33.40	21 52 44.5	12.8	4.9	0.35
16	0 34	14 11 15.01	−13 57 39.4	6.4	2.4	0.17	Dec. 1	0 2	16 40 10.72	−21 22 21.7	12.9	4.9	0.35
17	0 36	14 17 4.65	14 34 42.0	6.4	2.4	0.17	1	23 53	16 34 36.27	20 51 20.9	13.0	4.9	0.35
18	0 38	14 22 53.74	15 10 57.9	6.5	2.5	0.17	2	23 43	16 29 1.17	20 20 30.8	12.9	4.9	0.35
19	0 40	14 28 42.34	15 46 26.2	6.5	2.5	0.17	3	23 34	16 23 36.57	19 50 43.9	12.9	4.9	0.35
20	0 42	14 34 30.50	16 21 5.5	6.5	2.5	0.17	4	23 25	16 18 32.78	19 22 52.2	12.7	4.8	0.34
21	0 44	14 40 18.23	−16 54 54.5	6.6	2.5	0.17	5	23 16	16 13 58.66	−18 57 42.7	12.5	4.8	0.34
22	0 46	14 46 5.54	17 27 52.1	6.6	2.5	0.18	6	23 8	16 10 1.09	18 35 53.7	12.3	4.7	0.33
23	0 47	14 51 52.40	17 59 56.5	6.7	2.5	0.18	7	23 1	16 6 44.85	18 17 52.1	12.0	4.6	0.32
24	0 49	14 57 38.80	18 31 6.8	6.7	2.5	0.18	8	22 55	16 4 12.66	18 3 53.4	11.7	4.5	0.31
25	0 51	15 3 24.66	19 1 21.3	6.8	2.6	0.18	9	22 49	16 2 25.42	17 54 1.6	11.4	4.4	0.30
26	0 53	15 9 9.88	−19 30 38.6	6.8	2.6	0.18	10	22 44	16 1 22.55	−17 48 11.4	11.2	4.2	0.30
27	0 55	15 14 54.35	19 58 57.2	6.9	2.6	0.19	11	22 40	16 1 2.40	17 46 10.2	10.9	4.1	0.29
28	0 57	15 20 37.93	20 26 15.5	6.9	2.6	0.19	12	22 36	16 1 22.54	17 47 39.9	10.6	4.0	0.28
29	0 58	15 26 20.41	20 52 31.8	7.0	2.7	0.19	13	22 33	16 2 20.15	17 52 19.7	10.3	3.9	0.27
30	1 0	15 32 1.58	21 17 44.6	7.1	2.7	0.19	14	22 31	16 3 52.14	17 59 47.0	10.0	3.8	0.27
31	1 2	15 37 41.13	−21 41 52.0	7.2	2.7	0.20	15	22 29	16 5 55.45	−18 9 38.8	9.8	3.7	0.26
Nov. 1	1 3	15 43 18.75	22 4 52.3	7.3	2.8	0.20	16	22 28	16 8 27.06	18 21 32.9	9.5	3.6	0.25
2	1 5	15 48 54.08	22 26 43.5	7.3	2.8	0.20	17	22 27	16 11 24.15	18 35 8.3	9.3	3.5	0.25
3	1 7	15 54 26.63	22 47 23.9	7.4	2.8	0.20	18	22 26	16 14 44.12	18 50 5.4	9.1	3.4	0.24
4	1 8	15 59 55.91	23 6 51.2	7.5	2.9	0.21	19	22 26	16 18 24.57	19 6 6.3	8.9	3.4	0.24
5	1 10	16 5 21.30	−23 25 3.6	7.6	2.9	0.21	20	22 26	16 22 23.36	−19 22 55.0	8.7	3.3	0.23
6	1 11	16 10 42.12	23 41 58.8	7.8	3.0	0.22	21	22 26	16 26 38.57	19 40 16.9	8.5	3.2	0.23
7	1 12	16 15 57.58	23 57 34.6	7.9	3.0	0.22	22	22 27	16 31 8.49	19 57 59.1	8.3	3.2	0.22
8	1 14	16 21 6.78	24 11 48.8	8.0	3.0	0.22	23	22 27	16 35 51.63	20 15 50.3	8.2	3.1	0.22
9	1 15	16 26 8.69	24 24 39.0	8.1	3.1	0.23	24	22 28	16 40 46.63	20 33 40.1	8.0	3.1	0.22
10	1 16	16 31 2.11	−24 36 2.8	8.3	3.2	0.23	25	22 30	16 45 52.34	−20 51 19.7	7.9	3.0	0.21
11	1 16	16 35 45.74	24 45 57.4	8.5	3.2	0.24	26	22 31	16 51 7.74	21 8 41.2	7.8	2.9	0.21
12	1 17	16 40 18.06	24 54 20.2	8.6	3.3	0.24	27	22 32	16 56 31.91	21 25 37.4	7.7	2.9	0.21
13	1 17	16 44 37.35	25 1 8.5	8.8	3.3	0.25	28	22 34	17 2 4.03	21 42 2.3	7.5	2.9	0.21
14	1 17	16 48 41.73	25 6 19.0	9.0	3.4	0.25	29	22 36	17 7 43.43	21 57 50.3	7.4	2.8	0.20
15	1 17	16 52 29.05	−25 9 48.8	9.2	3.5	0.26	30	22 37	17 13 29.47	−22 12 56.5	7.3	2.8	0.20
16	1 17	16 55 56.91	−25 11 34.2	9.4	3.6	0.26	31	22 39	17 19 21.61	−22 27 16.8	7.2	2.7	0.20

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Jan. 1	0 44	19 25 32.46	−23 4 5.1	5.2	5.1	0.37
2	0 46	19 30 57.78	22 54 30.2	5.2	5.1	0.37
3	0 47	19 36 22.27	22 44 13.3	5.2	5.1	0.37
4	0 49	19 41 45.88	22 33 14.8	5.3	5.1	0.37
5	0 50	19 47 8.54	22 21 35.2	5.3	5.1	0.37
6	0 51	19 52 30.22	−22 9 14.9	5.3	5.1	0.37
7	0 53	19 57 50.86	21 56 14.6	5.3	5.1	0.37
8	0 54	20 3 10.44	21 42 34.8	5.3	5.1	0.37
9	0 56	20 8 28.91	21 28 16.1	5.3	5.1	0.37
10	0 57	20 13 46.24	21 13 19.0	5.3	5.1	0.37
11	0 58	20 19 2.40	−20 57 44.1	5.3	5.1	0.37
12	1 0	20 24 17.36	20 41 32.1	5.3	5.1	0.37
13	1 1	20 29 31.11	20 24 43.8	5.3	5.1	0.37
14	1 2	20 34 43.62	20 7 19.6	5.3	5.2	0.37
15	1 3	20 39 54.86	19 49 20.1	5.3	5.2	0.37
16	1 5	20 45 4.84	−19 30 46.1	5.3	5.2	0.37
17	1 6	20 50 13.52	19 11 38.3	5.3	5.2	0.37
18	1 7	20 55 20.92	18 51 57.4	5.3	5.2	0.37
19	1 8	21 0 27.02	18 31 44.2	5.3	5.2	0.37
20	1 9	21 5 31.80	18 10 59.3	5.4	5.2	0.37
21	1 10	21 10 35.30	−17 49 43.4	5.4	5.2	0.37
22	1 11	21 15 37.48	17 27 57.4	5.4	5.2	0.37
23	1 13	21 20 38.36	17 5 42.0	5.4	5.2	0.37
24	1 14	21 25 37.96	16 42 58.0	5.4	5.2	0.36
25	1 15	21 30 36.26	16 19 46.1	5.4	5.2	0.36
26	1 16	21 35 33.28	−15 56 7.1	5.4	5.2	0.36
27	1 17	21 40 29.04	15 32 1.8	5.4	5.2	0.36
28	1 18	21 45 23.54	15 7 30.9	5.4	5.3	0.36
29	1 18	21 50 16.80	14 42 35.3	5.4	5.3	0.36
30	1 19	21 55 8.83	14 17 15.7	5.4	5.3	0.36
31	1 20	21 59 59.66	−13 51 33.0	5.4	5.3	0.36
Feb. 1	1 21	22 4 49.31	13 25 28.0	5.4	5.3	0.36
2	1 22	22 9 37.77	12 59 1.4	5.5	5.3	0.36
3	1 23	22 14 25.09	12 32 14.1	5.5	5.3	0.36
4	1 24	22 19 11.29	12 5 7.0	5.5	5.3	0.36
5	1 24	22 23 56.38	−11 37 40.6	5.5	5.3	0.36
6	1 25	22 28 40.40	11 9 56.0	5.5	5.3	0.36
7	1 26	22 33 23.38	10 41 53.7	5.5	5.4	0.36
8	1 27	22 38 5.35	10 13 34.8	5.5	5.4	0.36
9	1 28	22 42 46.32	9 45 0.0	5.5	5.4	0.36
10	1 28	22 47 26.35	− 9 16 9.9	5.5	5.4	0.36
11	1 29	22 52 5.45	8 47 5.4	5.6	5.4	0.36
12	1 30	22 56 43.68	8 17 47.3	5.6	5.4	0.36
13	1 30	23 1 21.07	7 48 16.4	5.6	5.4	0.36
14	1 31	23 5 57.65	7 18 33.3	5.6	5.4	0.36
15	1 32	23 10 33.47	− 6 48 38.8	5.6	5.4	0.36
16	*1 32*	*23 15* 8.56	− 6 18 33.7	5.6	5.5	0.36
Feb. 16	1 32	23 15 8.56	− 6 18 33.7	5.6	5.5	0.36
17	1 33	23 19 42.97	5 48 18.8	5.6	5.5	0.36
18	1 34	23 24 16.75	5 17 54.7	5.6	5.5	0.37
19	1 34	23 28 49.92	4 47 22.2	5.6	5.5	0.37
20	1 35	23 33 22.53	4 16 42.2	5.7	5.5	0.37
21	1 35	23 37 54.63	− 3 45 55.2	5.7	5.5	0.37
22	1 36	23 42 26.24	3 15 2.1	5.7	5.5	0.37
23	1 37	23 46 57.43	2 44 3.6	5.7	5.5	0.37
24	1 37	23 51 28.24	2 13 0.5	5.7	5.6	0.37
25	1 38	23 55 58.69	1 41 53.5	5.7	5.6	0.37
26	1 38	0 0 28.84	− 1 10 43.3	5.7	5.6	0.37
27	1 39	0 4 58.74	0 39 30.6	5.8	5.6	0.37
28	1 39	0 9 28.41	− 0 8 16.3	5.8	5.6	0.37
Mar. 1	1 40	0 13 57.91	+ 0 22 58.9	5.8	5.6	0.38
2	1 40	0 18 27.27	0 54 14.2	5.8	5.6	0.38
3	1 41	0 22 56.54	+ 1 25 29.0	5.8	5.7	0.38
4	1 42	0 27 25.75	1 56 42.4	5.8	5.7	0.38
5	1 42	0 31 54.93	2 27 53.7	5.8	5.7	0.38
6	1 43	0 36 24.13	2 59 2.1	5.9	5.7	0.38
7	1 43	0 40 53.40	3 30 7.0	5.9	5.7	0.38
8	1 44	0 45 22.76	+ 4 1 7.5	5.9	5.7	0.38
9	1 44	0 49 52.26	4 32 2.9	5.9	5.7	0.38
10	1 45	0 54 21.95	5 2 52.5	6.0	5.8	0.38
11	1 45	0 58 51.84	5 33 35.7	6.0	5.8	0.39
12	1 46	1 3 21.97	6 4 11.6	6.0	5.8	0.39
13	1 47	1 7 52.42	+ 6 34 39.4	6.0	5.8	0.39
14	1 47	1 12 23.21	7 4 58.5	6.0	5.8	0.39
15	1 48	1 16 54.37	7 35 8.3	6.0	5.9	0.39
16	1 48	1 21 25.94	8 5 7.8	6.0	5.9	0.39
17	1 49	1 25 57.96	8 34 56.4	6.1	5.9	0.40
18	1 49	1 30 30.48	+ 9 4 33.5	6.1	5.9	0.40
19	1 50	1 35 3.53	9 33 58.3	6.1	5.9	0.40
20	1 51	1 39 37.14	10 3 10.1	6.1	5.9	0.40
21	1 51	1 44 11.36	10 32 7.9	6.1	6.0	0.40
22	1 52	1 48 46.22	11 0 51.2	6.2	6.0	0.41
23	1 53	1 53 21.74	+11 29 19.3	6.2	6.0	0.41
24	1 53	1 57 57.97	11 57 31.5	6.2	6.0	0.41
25	1 54	2 2 34.93	12 25 26.9	6.2	6.1	0.41
26	1 55	2 7 12.65	12 53 4.9	6.3	6.1	0.42
27	1 55	2 11 51.16	13 20 24.7	6.3	6.1	0.42
28	1 56	2 16 30.50	+13 47 25.5	6.3	6.1	0.42
29	1 57	2 21 10.66	14 14 6.6	6.3	6.1	0.42
30	1 57	2 25 51.69	14 40 27.3	6.3	6.2	0.42
31	1 58	2 30 33.60	15 6 26.8	6.4	6.2	0.43
Apr. 1	1 59	2 35 16.42	15 32 4.5	6.4	6.2	0.43
2	2 0	2 40 0.15	+15 57 19.4	6.4	6.2	0.43
3	2 0	2 44 44.78	+16 22 10.9	6.4	6.3	0.44

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Apr. 1	1 59	2 35 16.42	+15 32 4.5	6.4	6.2	0.43
2	2 0	2 40 0.15	15 57 19.4	6.4	6.2	0.43
3	2 0	2 44 44.78	16 22 10.9	6.4	6.3	0.44
4	2 1	2 49 30.36	16 46 38.3	6.5	6.3	0.44
5	2 2	2 54 16.89	17 10 40.8	6.5	6.3	0.44
6	2 3	2 59 4.36	+17 34 17.7	6.5	6.3	0.44
7	2 4	3 3 52.79	17 57 28.3	6.6	6.4	0.45
8	2 5	3 8 42.17	18 20 11.9	6.6	6.4	0.45
9	2 6	3 13 32.51	18 42 27.8	6.6	6.4	0.45
10	2 7	3 18 23.81	19 4 15.3	6.6	6.5	0.46
11	2 7	3 23 16.06	+19 25 33.8	6.7	6.5	0.46
12	2 8	3 28 9.28	19 46 22.5	6.7	6.5	0.46
13	2 9	3 33 3.44	20 6 40.8	6.7	6.5	0.47
14	2 10	3 37 58.54	20 26 28.0	6.8	6.6	0.47
15	2 11	3 42 54.58	20 45 43.5	6.8	6.6	0.47
16	2 12	3 47 51.53	+21 4 26.7	6.8	6.6	0.47
17	2 13	3 52 49.39	21 22 36.9	6.9	6.7	0.48
18	2 14	3 57 48.13	21 40 13.5	6.9	6.7	0.48
19	2 15	4 2 47.75	21 57 16.0	6.9	6.7	0.48
20	2 17	4 7 48.21	22 13 43.7	6.9	6.8	0.49
21	2 18	4 12 49.50	+22 29 36.2	7.0	6.8	0.49
22	2 19	4 17 51.58	22 44 52.8	7.0	6.8	0.49
23	2 20	4 22 54.42	22 59 33.1	7.1	6.9	0.50
24	2 21	4 27 57.99	23 13 36.4	7.1	6.9	0.50
25	2 22	4 33 2.26	23 27 2.4	7.1	6.9	0.50
26	2 23	4 38 7.18	+23 39 50.6	7.2	7.0	0.51
27	2 24	4 43 12.70	23 52 0.5	7.2	7.0	0.51
28	2 25	4 48 18.80	24 3 31.7	7.2	7.0	0.52
29	2 27	4 53 25.42	24 14 23.8	7.3	7.1	0.52
30	2 28	4 58 32.49	24 24 36.5	7.3	7.1	0.52
May 1	2 29	5 3 39.98	+24 34 9.2	7.4	7.2	0.53
2	2 30	5 8 47.81	24 43 1.9	7.4	7.2	0.53
3	2 31	5 13 55.93	24 51 14.3	7.4	7.2	0.53
4	2 33	5 19 4.26	24 58 46.0	7.5	7.3	0.54
5	2 34	5 24 12.75	25 5 36.7	7.5	7.3	0.54
6	2 35	5 29 21.33	+25 11 46.3	7.6	7.4	0.54
7	2 36	5 34 29.94	25 17 14.7	7.6	7.4	0.55
8	2 37	5 39 38.51	25 22 1.6	7.7	7.5	0.55
9	2 39	5 44 46.96	25 26 7.2	7.7	7.5	0.55
10	2 40	5 49 55.24	25 29 31.1	7.8	7.6	0.56
11	2 41	5 55 3.28	+25 32 13.3	7.8	7.6	0.56
12	2 42	6 0 10.99	25 34 14.0	7.9	7.7	0.57
13	2 43	6 5 18.32	25 35 33.1	7.9	7.7	0.57
14	2 44	6 10 25.18	25 36 10.6	8.0	7.8	0.57
15	2 45	6 15 31.53	25 36 6.7	8.0	7.8	0.58
16	2 47	6 20 37.29	+25 35 21.3	8.1	7.9	0.58
17	2 48	6 25 42.38	+25 33 54.8	8.1	7.9	0.58
May 17	2 48	6 25 42.38	+25 33 54.8	8.1	7.9	0.58
18	2 49	6 30 46.76	25 31 47.4	8.2	8.0	0.59
19	2 50	6 35 50.35	25 28 59.0	8.3	8.0	0.59
20	2 51	6 40 53.09	25 25 30.0	8.3	8.1	0.60
21	2 52	6 45 54.92	25 21 20.6	8.4	8.1	0.60
22	2 53	6 50 55.77	+25 16 31.2	8.4	8.2	0.60
23	2 54	6 55 55.57	25 11 2.2	8.5	8.3	0.61
24	2 55	7 0 54.27	25 4 53.7	8.5	8.3	0.61
25	2 56	7 5 51.80	24 58 6.3	8.6	8.4	0.61
26	2 57	7 10 48.11	24 50 40.2	8.7	8.4	0.62
27	2 58	7 15 43.13	+24 42 35.9	8.7	8.5	0.62
28	2 59	7 20 36.81	24 33 53.9	8.8	8.6	0.63
29	3 0	7 25 29.08	24 24 34.9	8.9	8.6	0.63
30	3 1	7 30 19.89	24 14 39.0	8.9	8.7	0.63
31	3 2	7 35 9.19	24 4 7.0	9.0	8.8	0.64
June 1	3 3	7 39 56.90	+23 52 59.4	9.1	8.8	0.64
2	3 4	7 44 42.96	23 41 16.9	9.2	8.9	0.65
3	3 5	7 49 27.34	23 29 0.0	9.2	9.0	0.65
4	3 5	7 54 10.00	23 16 9.3	9.3	9.0	0.66
5	3 6	7 58 50.88	23 2 45.5	9.4	9.1	0.66
6	3 7	8 3 29.92	+22 48 49.3	9.5	9.2	0.67
7	3 7	8 8 7.09	22 34 21.1	9.5	9.3	0.67
8	3 8	8 12 42.35	22 19 21.9	9.6	9.4	0.67
9	3 9	8 17 15.66	22 3 52.3	9.7	9.4	0.68
10	3 9	8 21 46.98	21 47 52.8	9.8	9.5	0.68
11	3 10	8 26 16.29	+21 31 24.3	9.9	9.6	0.69
12	3 10	8 30 43.54	21 14 27.4	10.0	9.7	0.69
13	3 11	8 35 8.71	20 57 2.8	10.1	9.8	0.70
14	3 11	8 39 31.79	20 39 11.3	10.2	9.9	0.70
15	3 12	8 43 52.72	20 20 53.6	10.3	10.0	0.71
16	3 12	8 48 11.50	+20 2 10.4	10.4	10.1	0.71
17	3 13	8 52 28.10	19 43 2.5	10.5	10.2	0.72
18	3 13	8 56 42.50	19 23 30.6	10.6	10.3	0.72
19	3 13	9 0 54.69	19 3 35.5	10.7	10.4	0.73
20	3 13	9 5 4.65	18 43 17.8	10.8	10.5	0.73
21	3 13	9 9 12.35	+18 22 38.3	10.9	10.6	0.74
22	3 13	9 13 17.78	18 1 37.7	11.0	10.7	0.75
23	3 14	9 17 20.93	17 40 16.9	11.1	10.8	0.75
24	3 14	9 21 21.76	17 18 36.7	11.2	10.9	0.76
25	3 14	9 25 20.28	16 56 37.8	11.3	11.0	0.77
26	3 14	9 29 16.45	+16 34 20.9	11.4	11.1	0.77
27	3 14	9 33 10.25	16 11 46.9	11.6	11.2	0.78
28	3 13	9 37 1.66	15 48 56.7	11.7	11.4	0.79
29	3 13	9 40 50.64	15 25 51.1	11.8	11.5	0.80
30	3 13	9 44 37.17	15 2 30.8	11.9	11.6	0.80
July 1	3 13	9 48 21.23	+14 38 56.8	12.1	11.7	0.81
2	3 13	9 52 2.79	+14 15 9.8	12.2	11.8	0.81

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	3 13	9 48 21.23	+14 38 56.8	12.1	11.7	0.81	Aug. 16	2 3	11 39 26.46	− 3 11 29.6	23.1	22.4	1.49
2	3 13	9 52 2.79	14 15 9.8	12.2	11.9	0.81	17	1 59	11 39 52.31	3 27 3.3	23.4	22.8	1.52
3	3 12	9 55 41.79	13 51 10.6	12.3	12.0	0.82	18	1 56	11 40 10.59	3 41 50.2	23.8	23.1	1.54
4	3 12	9 59 18.22	13 27 0.2	12.5	12.1	0.83	19	1 52	11 40 21.15	3 55 47.6	24.2	23.5	1.57
5	3 12	10 2 52.06	13 2 39.3	12.6	12.3	0.84	20	1 48	11 40 23.84	4 8 53.2	24.6	23.9	1.59
6	3 11	10 6 23.26	+12 38 8.8	12.8	12.4	0.85	21	1 44	11 40 18.53	− 4 21 4.4	25.0	24.3	1.62
7	3 11	10 9 51.78	12 13 29.5	12.9	12.6	0.86	22	1 40	11 40 5.12	4 32 18.6	25.4	24.6	1.65
8	3 10	10 13 17.60	11 48 42.3	13.1	12.7	0.87	23	1 36	11 39 43.53	4 42 32.9	25.7	25.0	1.67
9	3 10	10 16 40.67	11 23 47.8	13.2	12.9	0.88	24	1 31	11 39 13.69	4 51 45.0	26.1	25.4	1.70
10	3 9	10 20 0.95	10 58 47.0	13.4	13.0	0.89	25	1 27	11 38 35.57	4 59 52.2	26.5	25.7	1.72
11	3 8	10 23 18.41	+10 33 40.8	13.6	13.2	0.90	26	1 22	11 37 49.18	− 5 6 52.0	26.9	26.1	1.75
12	3 8	10 26 33.00	10 8 30.0	13.7	13.4	0.91	27	1 17	11 36 54.55	5 12 41.8	27.2	26.5	1.77
13	3 7	10 29 44.68	9 43 15.4	13.9	13.5	0.91	28	1 12	11 35 51.78	5 17 19.2	27.6	26.8	1.79
14	3 6	10 32 53.40	9 17 57.9	14.1	13.7	0.92	29	1 7	11 34 41.00	5 20 42.3	28.0	27.2	1.82
15	3 6	10 35 59.11	8 52 38.2	14.3	13.9	0.93	30	1 2	11 33 22.40	5 22 49.0	28.3	27.5	1.84
16	3 5	10 39 1.76	+ 8 27 17.3	14.5	14.1	0.95	31	0 56	11 31 56.23	− 5 23 37.9	28.6	27.8	1.86
17	3 4	10 42 1.30	8 1 56.0	14.7	14.2	0.96	Sept. 1	0 51	11 30 22.80	5 23 7.5	29.0	28.2	1.88
18	3 3	10 44 57.66	7 36 35.1	14.9	14.4	0.97	2	0 45	11 28 42.51	5 21 17.3	29.3	28.4	1.90
19	3 2	10 47 50.80	7 11 15.6	15.1	14.6	0.98	3	0 40	11 26 55.78	5 18 6.6	29.5	28.7	1.92
20	3 1	10 50 40.64	6 45 58.3	15.3	14.8	0.99	4	0 34	11 25 3.13	5 13 35.4	29.8	29.0	1.94
21	2 59	10 53 27.11	+ 6 20 44.3	15.5	15.1	1.01	5	0 28	11 23 5.13	− 5 7 44.4	30.1	29.2	1.96
22	2 58	10 56 10.14	5 55 34.4	15.7	15.3	1.03	6	0 22	11 21 2.40	5 0 34.7	30.3	29.5	1.97
23	2 57	10 58 49.64	5 30 29.7	15.9	15.5	1.04	7	0 16	11 18 55.64	4 52 8.1	30.5	29.6	1.98
24	2 56	11 1 25.54	5 5 31.0	16.2	15.7	1.05	8	0 10	11 16 45.60	4 42 27.3	30.6	29.8	1.99
25	2 54	11 3 57.73	4 40 39.6	16.4	15.9	1.06	9	0 4	11 14 33.08	4 31 35.5	30.8	29.9	2.00
26	2 53	11 6 26.10	+ 4 15 56.3	16.6	16.2	1.08	9	23 58	11 12 18.89	− 4 19 36.1	30.9	30.0	2.01
27	2 51	11 8 50.55	3 51 22.6	16.9	16.4	1.09	10	23 51	11 10 3.91	4 6 33.3	31.0	30.1	2.01
28	2 50	11 11 10.95	3 26 59.4	17.1	16.6	1.11	11	23 45	11 7 49.02	3 52 32.1	31.0	30.2	2.01
29	2 48	11 13 27.16	3 2 48.0	17.4	16.9	1.12	12	23 39	11 5 35.10	3 37 37.8	31.0	30.2	2.01
30	2 46	11 15 39.09	2 38 49.7	17.6	17.1	1.14	13	23 33	11 3 23.02	3 21 56.2	31.0	30.2	2.01
31	2 44	11 17 46.57	+ 2 15 5.7	17.9	17.4	1.16	14	23 27	11 1 13.63	− 3 5 33.3	31.0	30.1	2.01
Aug. 1	2 42	11 19 49.45	1 51 37.3	18.2	17.7	1.18	15	23 21	10 59 7.75	2 48 35.6	30.9	30.0	2.00
2	2 40	11 21 47.59	1 28 26.1	18.5	17.9	1.20	16	23 15	10 57 6.17	2 31 9.6	30.8	30.0	2.00
3	2 38	11 23 40.83	1 5 33.2	18.7	18.2	1.21	17	23 9	10 55 9.62	2 13 21.9	30.7	29.9	1.99
4	2 36	11 25 28.99	0 43 0.1	19.0	18.5	1.23	18	23 3	10 53 18.79	1 55 18.5	30.5	29.7	1.98
5	2 34	11 27 11.90	+ 0 20 48.5	19.3	18.8	1.25	19	22 58	10 51 34.28	− 1 37 6.1	30.3	29.5	1.97
6	2 32	11 28 49.43	− 0 1 0.0	19.7	19.1	1.27	20	22 52	10 49 56.66	1 18 51.1	30.1	29.3	1.95
7	2 29	11 30 21.36	0 22 24.0	20.0	19.4	1.29	21	22 47	10 48 26.43	1 0 39.3	29.9	29.0	1.94
8	2 27	11 31 47.51	0 43 21.5	20.3	19.7	1.31	22	22 41	10 47 4.01	0 42 36.6	29.6	28.8	1.92
9	2 24	11 33 7.70	1 3 51.0	20.6	20.0	1.33	23	22 36	10 45 49.77	0 24 48.1	29.3	28.5	1.90
10	2 21	11 34 21.75	− 1 23 50.5	20.9	20.3	1.36	24	22 31	10 44 44.02	− 0 7 19.1	29.0	28.2	1.88
11	2 19	11 35 29.46	1 43 18.4	21.3	20.7	1.38	25	22 26	10 43 46.99	+ 0 9 45.9	28.7	27.9	1.86
12	2 16	11 36 30.64	2 2 12.5	21.6	21.0	1.40	26	22 22	10 42 58.88	0 26 22.3	28.4	27.6	1.84
13	2 13	11 37 25.12	2 20 30.6	22.0	21.3	1.42	27	22 17	10 42 19.83	0 42 26.2	28.1	27.3	1.82
14	2 10	11 38 12.70	2 38 11.0	22.3	21.7	1.45	28	22 13	10 41 49.91	0 57 54.3	27.7	26.9	1.79
15	2 6	11 38 53.21	− 2 55 11.5	22.7	22.0	1.47	29	22 8	10 41 29.16	+ 1 12 43.2	27.4	26.6	1.77
16	*2 3*	*11 39 26.46*	− 3 11 29.6	23.1	22.4	1.49	30	22 4	10 41 17.58	+ 1 26 50.5	27.0	26.2	1.75

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Sept. 30	22 4	10 41 17.58	+1 26 50.5	27.0	26.2	1.75
Oct. 1	22 0	10 41 15.12	1 40 13.5	26.6	25.9	1.73
2	21 56	10 41 21.70	1 52 50.3	26.3	25.5	1.70
3	21 53	10 41 37.22	2 4 38.9	25.9	25.2	1.68
4	21 49	10 42 1.54	2 15 38.3	25.5	24.8	1.65
5	21 46	10 42 34.50	+2 25 47.0	25.1	24.4	1.63
6	21 42	10 43 15.93	2 35 4.3	24.8	24.1	1.60
7	21 39	10 44 5.65	2 43 29.3	24.4	23.7	1.58
8	21 36	10 45 3.45	2 51 1.7	24.0	23.3	1.56
9	21 34	10 46 9.11	2 57 41.2	23.7	23.0	1.53
10	21 31	10 47 22.41	+3 3 27.6	23.3	22.6	1.51
11	21 28	10 48 43.12	3 8 21.2	22.9	22.3	1.49
12	21 26	10 50 11.01	3 12 22.1	22.6	21.9	1.46
13	21 23	10 51 45.81	3 15 30.7	22.2	21.6	1.44
14	21 21	10 53 27.29	3 17 47.7	21.9	21.3	1.42
15	21 19	10 55 15.21	+3 19 13.5	21.5	21.0	1.40
16	21 17	10 57 9.30	3 19 49.0	21.2	20.6	1.38
17	21 15	10 59 9.32	3 19 34.9	20.9	20.3	1.35
18	21 13	11 1 15.03	3 18 31.9	20.6	20.0	1.33
19	21 11	11 3 26.21	3 16 41.0	20.3	19.7	1.31
20	21 10	11 5 42.61	+3 14 3.1	20.0	19.4	1.29
21	21 8	11 8 4.02	3 10 38.9	19.7	19.1	1.27
22	21 7	11 10 30.24	3 6 29.6	19.4	18.8	1.25
23	21 5	11 13 1.06	3 1 36.1	19.1	18.5	1.24
24	21 4	11 15 36.26	2 55 59.4	18.8	18.3	1.22
25	21 3	11 18 15.67	+2 49 40.4	18.5	18.0	1.20
26	21 1	11 20 59.12	2 42 40.1	18.2	17.7	1.18
27	21 0	11 23 46.46	2 34 59.5	18.0	17.5	1.16
28	20 59	11 26 37.47	2 26 39.5	17.7	17.3	1.15
29	20 58	11 29 32.05	2 17 41.0	17.5	17.0	1.13
30	20 57	11 32 30.03	+2 8 5.1	17.2	16.7	1.12
31	20 56	11 35 31.27	1 57 52.9	17.0	16.5	1.10
Nov. 1	20 55	11 38 35.65	1 47 5.2	16.8	16.3	1.09
2	20 55	11 41 43.03	1 35 43.0	16.5	16.1	1.07
3	20 54	11 44 53.32	1 23 47.0	16.3	15.8	1.06
4	20 53	11 48 6.39	+1 11 18.4	16.1	15.6	1.04
5	20 52	11 51 22.17	0 58 18.1	15.9	15.4	1.03
6	20 52	11 54 40.53	0 44 47.1	15.7	15.2	1.02
7	20 51	11 58 1.41	0 30 46.3	15.5	15.0	1.00
8	20 51	12 1 24.69	0 16 16.9	15.3	14.8	0.99
9	20 50	12 4 50.31	+0 1 19.6	15.1	14.6	0.98
10	20 50	12 8 18.19	−0 14 4.7	14.9	14.5	0.96
11	20 49	12 11 48.24	0 29 54.7	14.7	14.3	0.95
12	20 49	12 15 20.39	0 46 9.4	14.5	14.1	0.94
13	20 48	12 18 54.58	1 2 47.9	14.3	13.9	0.93
14	20 48	12 22 30.72	−1 19 49.3	14.2	13.7	0.92
15	20 48	12 26 8.77	−1 37 12.5	14.0	13.6	0.91
Nov. 15	20 48	12 26 8.77	− 1 37 12.5	14.0	13.6	0.91
16	20 48	12 29 48.65	1 54 56.4	13.8	13.4	0.90
17	20 47	12 33 30.30	2 13 0.1	13.7	13.3	0.89
18	20 47	12 37 13.70	2 31 22.7	13.5	13.1	0.88
19	20 47	12 40 58.77	2 50 3.1	13.4	13.0	0.87
20	20 47	12 44 45.47	− 3 9 0.4	13.2	12.8	0.86
21	20 47	12 48 33.78	3 28 13.5	13.1	12.7	0.85
22	20 46	12 52 23.64	3 47 41.6	12.9	12.6	0.84
23	20 46	12 56 15.04	4 7 23.7	12.8	12.4	0.83
24	20 46	13 0 7.93	4 27 18.8	12.6	12.3	0.82
25	20 46	13 4 2.31	− 4 47 26.0	12.5	12.1	0.81
26	20 46	13 7 58.13	5 7 44.5	12.4	12.0	0.80
27	20 46	13 11 55.39	5 28 13.2	12.2	11.9	0.80
28	20 46	13 15 54.07	5 48 51.3	12.1	11.8	0.79
29	20 46	13 19 54.15	6 9 37.8	12.0	11.6	0.79
30	20 46	13 23 55.63	− 6 30 31.9	11.9	11.5	0.78
Dec. 1	20 47	13 27 58.48	6 51 32.6	11.7	11.4	0.77
2	20 47	13 32 2.72	7 12 39.2	11.6	11.3	0.76
3	20 47	13 36 8.35	7 33 50.6	11.5	11.2	0.76
4	20 47	13 40 15.34	7 55 5.9	11.4	11.1	0.75
5	20 47	13 44 23.73	− 8 16 24.3	11.3	11.0	0.74
6	20 47	13 48 33.48	8 37 44.9	11.2	10.9	0.73
7	20 48	13 52 44.62	8 59 6.8	11.1	10.8	0.73
8	20 48	13 56 57.17	9 20 29.0	11.0	10.7	0.72
9	20 48	14 1 11.07	9 41 50.8	10.9	10.6	0.72
10	20 49	14 5 26.37	−10 3 11.0	10.8	10.5	0.71
11	20 49	14 9 43.07	10 24 28.9	10.7	10.4	0.71
12	20 49	14 14 1.14	10 45 43.4	10.6	10.3	0.70
13	20 50	14 18 20.59	11 6 53.7	10.5	10.2	0.70
14	20 50	14 22 41.42	11 27 58.8	10.4	10.1	0.69
15	20 50	14 27 3.64	−11 48 57.9	10.3	10.0	0.68
16	20 51	14 31 27.22	12 9 49.9	10.2	9.9	0.68
17	20 51	14 35 52.18	12 30 34.0	10.1	9.8	0.67
18	20 52	14 40 18.51	12 51 9.2	10.0	9.8	0.67
19	20 52	14 44 46.22	13 11 34.8	10.0	9.7	0.66
20	20 53	14 49 15.30	−13 31 49.9	9.9	9.6	0.66
21	20 53	14 53 45.74	13 51 53.3	9.8	9.5	0.66
22	20 54	14 58 17.56	14 11 44.4	9.7	9.5	0.65
23	20 55	15 2 50.75	14 31 22.4	9.6	9.4	0.65
24	20 55	15 7 25.30	14 50 46.1	9.6	9.3	0.64
25	20 56	15 12 1.21	−15 9 54.9	9.5	9.2	0.64
26	20 57	15 16 38.49	15 28 47.9	9.4	9.2	0.64
27	20 57	15 21 17.12	15 47 24.1	9.4	9.1	0.63
28	20 58	15 25 57.12	16 5 42.9	9.3	9.0	0.63
29	20 59	15 30 38.47	16 23 43.3	9.2	9.0	0.63
30	21 0	15 35 21.17	−16 41 24.5	9.1	8.9	0.62
31	21 0	15 40 5.25	−16 58 45.8	9.1	8.8	0.62

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	12 8	6 47 27.69	+23 1 52.6	2.1	22.4	1.73	Feb. 15	8 47	6 26 39.12	+23 26 12.5	1.9	20.9	1.61
1	12 4	6 46 52.61	23 2 40.6	2.1	22.4	1.73	16	8 43	6 26 27.07	23 26 26.8	1.9	20.8	1.60
2	11 59	6 46 17.53	23 3 28.1	2.1	22.4	1.73	17	8 38	6 26 15.84	23 26 40.4	1.9	20.8	1.60
3	11 55	6 45 42.49	23 4 15.0	2.1	22.4	1.73	18	8 34	6 26 5.45	23 26 53.3	1.9	20.7	1.59
4	11 50	6 45 7.50	23 5 1.3	2.1	22.4	1.73	19	8 30	6 25 55.91	23 27 5.7	1.9	20.6	1.59
5	11 46	6 44 32.60	+23 5 47.0	2.1	22.4	1.72	20	8 26	6 25 47.21	+23 27 17.4	1.9	20.6	1.59
6	11 41	6 43 57.80	23 6 32.1	2.1	22.4	1.72	21	8 22	6 25 39.36	23 27 28.5	1.9	20.5	1.58
7	11 37	6 43 23.14	23 7 16.6	2.1	22.4	1.72	22	8 18	6 25 32.35	23 27 39.1	1.9	20.5	1.58
8	11 32	6 42 48.65	23 8 0.4	2.1	22.4	1.72	23	8 14	6 25 26.21	23 27 49.1	1.9	20.4	1.57
9	11 28	6 42 14.34	23 8 43.7	2.1	22.4	1.72	24	8 10	6 25 20.93	23 27 58.5	1.9	20.3	1.57
10	11 23	6 41 40.25	+23 9 26.1	2.1	22.3	1.72	25	8 6	6 25 16.51	+23 28 7.2	1.9	20.3	1.56
11	11 19	6 41 6.41	23 10 7.8	2.1	22.3	1.72	26	8 2	6 25 12.94	23 28 15.4	1.9	20.2	1.56
12	11 14	6 40 32.84	23 10 48.8	2.1	22.3	1.72	27	7 58	6 25 10.24	23 28 23.0	1.9	20.2	1.55
13	11 10	6 39 59.55	23 11 29.0	2.1	22.3	1.72	28	7 54	6 25 8.41	23 28 29.9	1.9	20.1	1.55
14	11 5	6 39 26.58	23 12 8.6	2.1	22.3	1.72	Mar. 1	7 50	6 25 7.44	23 28 36.3	1.9	20.0	1.54
15	11 1	6 38 53.94	+23 12 47.3	2.1	22.3	1.71	2	7 46	6 25 7.33	+23 28 42.3	1.9	20.0	1.54
16	10 56	6 38 21.67	23 13 25.1	2.1	22.2	1.71	3	7 42	6 25 8.08	23 28 47.6	1.9	19.9	1.53
17	10 52	6 37 49.78	23 14 2.2	2.1	22.2	1.71	4	7 38	6 25 9.70	23 28 52.3	1.9	19.8	1.53
18	10 47	6 37 18.28	23 14 38.5	2.1	22.2	1.71	5	7 34	6 25 12.18	23 28 56.4	1.9	19.8	1.52
19	10 43	6 36 47.22	23 15 14.0	2.1	22.1	1.70	6	7 30	6 25 15.51	23 29 0.0	1.8	19.7	1.52
20	10 38	6 36 16.60	+23 15 48.6	2.1	22.1	1.70	7	7 27	6 25 19.70	+23 29 3.0	1.8	19.6	1.51
21	10 34	6 35 46.45	23 16 22.6	2.1	22.1	1.70	8	7 23	6 25 24.73	23 29 5.4	1.8	19.6	1.51
22	10 30	6 35 16.81	23 16 55.6	2.1	22.0	1.70	9	7 19	6 25 30.62	23 29 7.2	1.8	19.5	1.50
23	10 25	6 34 47.67	23 17 27.8	2.1	22.0	1.69	10	7 15	6 25 37.34	23 29 8.5	1.8	19.5	1.50
24	10 21	6 34 19.05	23 17 59.3	2.1	22.0	1.69	11	7 11	6 25 44.90	23 29 9.2	1.8	19.4	1.49
25	10 16	6 33 50.99	+23 18 29.9	2.0	21.9	1.69	12	7 8	6 25 53.28	+23 29 9.4	1.8	19.3	1.49
26	10 12	6 33 23.51	23 18 59.7	2.0	21.9	1.68	13	7 4	6 26 2.49	23 29 9.0	1.8	19.3	1.49
27	10 8	6 32 56.63	23 19 28.7	2.0	21.8	1.68	14	7 0	6 26 12.51	23 29 7.9	1.8	19.2	1.48
28	10 3	6 32 30.33	23 19 57.0	2.0	21.8	1.68	15	6 56	6 26 23.35	23 29 6.3	1.8	19.2	1.48
29	9 59	6 32 4.67	23 20 24.4	2.0	21.8	1.68	16	6 53	6 26 34.98	23 29 4.1	1.8	19.1	1.47
30	9 54	6 31 39.67	+23 20 50.8	2.0	21.7	1.67	17	6 49	6 26 47.42	+23 29 1.3	1.8	19.0	1.47
31	9 50	6 31 15.34	23 21 16.6	2.0	21.7	1.67	18	6 45	6 27 0.66	23 28 57.9	1.8	19.0	1.46
Feb. 1	9 46	6 30 51.67	23 21 41.6	2.0	21.6	1.67	19	6 41	6 27 14.68	23 28 53.9	1.8	18.9	1.46
2	9 42	6 30 28.71	23 22 5.7	2.0	21.6	1.66	20	6 38	6 27 29.47	23 28 49.2	1.8	18.8	1.45
3	9 37	6 30 6.47	23 22 29.0	2.0	21.5	1.66	21	6 34	6 27 45.05	23 28 43.9	1.8	18.8	1.45
4	9 33	6 29 44.94	+23 22 51.7	2.0	21.5	1.65	22	6 30	6 28 1.39	+23 28 38.0	1.8	18.7	1.44
5	9 29	6 29 24.16	23 23 13.5	2.0	21.4	1.65	23	6 27	6 28 18.51	23 28 31.4	1.8	18.7	1.44
6	9 24	6 29 4.14	23 23 34.6	2.0	21.4	1.65	24	6 23	6 28 36.38	23 28 24.1	1.7	18.6	1.43
7	9 20	6 28 44.86	23 23 55.0	2.0	21.3	1.64	25	6 19	6 28 55.00	23 28 16.2	1.7	18.6	1.43
8	9 16	6 28 26.35	23 24 14.6	2.0	21.3	1.64	26	6 16	6 29 14.37	23 28 7.6	1.7	18.5	1.42
9	9 12	6 28 8.63	+23 24 33.6	2.0	21.2	1.63	27	6 12	6 29 34.47	+23 27 58.2	1.7	18.4	1.42
10	9 8	6 27 51.70	23 24 51.7	2.0	21.2	1.63	28	6 9	6 29 55.31	23 27 48.2	1.7	18.4	1.42
11	9 3	6 27 35.56	23 25 9.2	2.0	21.1	1.63	29	6 5	6 30 16.88	23 27 37.4	1.7	18.3	1.41
12	8 59	6 27 20.24	23 25 26.0	2.0	21.1	1.62	30	6 2	6 30 39.17	23 27 25.9	1.7	18.3	1.41
13	8 55	6 27 5.71	23 25 42.2	2.0	21.0	1.62	31	5 58	6 31 2.17	23 27 13.5	1.7	18.2	1.40
14	8 51	6 26 52.01	+23 25 57.7	2.0	20.9	1.61	Apr. 1	5 54	6 31 25.87	+23 27 0.3	1.7	18.1	1.40
15	8 47	6 26 39.12	+23 26 12.5	1.9	20.9	1.61	2	5 51	6 31 50.28	+23 26 46.5	1.7	18.1	1.39

Stellar magnitude at opposition in January, 1919, −2.3.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	5 54	6 31 25.87	+23 27 0.3	1.7	18.1	1.40	Nov. 15	17 43	9 20 50.08	+16 9 58.3	1.7	18.4	1.36
2	5 51	6 31 50.28	23 26 46.5	1.7	18.1	1.39	16	17 39	9 21 4.28	16 9 6.4	1.7	18.5	1.37
3	5 47	6 32 15.37	23 26 31.9	1.7	18.0	1.39	17	17 36	9 21 17.75	16 8 17.7	1.7	18.6	1.37
4	5 44	6 32 41.14	23 26 16.4	1.7	18.0	1.39	18	17 32	9 21 30.51	16 7 32.4	1.7	18.6	1.38
5	5 40	6 33 7.59	23 26 0.1	1.7	17.9	1.38	19	17 28	9 21 42.53	16 6 50.5	1.7	18.7	1.38
6	5 37	6 33 34.70	+23 25 43.1	1.7	17.9	1.38	20	17 24	9 21 53.84	+16 6 12.0	1.7	18.7	1.39
7	5 33	6 34 2.46	23 25 25.1	1.7	17.8	1.37	21	17 21	9 22 4.40	16 5 36.9	1.8	18.8	1.39
8	5 30	6 34 30.86	23 25 6.3	1.7	17.8	1.37	22	17 17	9 22 14.21	16 5 5.3	1.8	18.8	1.39
9	5 27	6 34 59.90	23 24 46.6	1.7	17.7	1.36	23	17 13	9 22 23.28	16 4 37.3	1.8	18.9	1.40
	. . . .	. . . .	. . . .	. .	. . . .	. . .	24	17 9	9 22 31.60	16 4 12.7	1.8	19.0	1.40
Oct. 10	19 49	9 5 14.70	+17 12 18.0	1.6	16.7	1.23	25	17 5	9 22 39.17	+16 3 51.7	1.8	19.0	1.41
11	19 46	9 5 50.49	17 9 54.5	1.6	16.7	1.24	26	17 2	9 22 45.97	16 3 34.1	1.8	19.1	1.41
12	19 42	9 6 25.80	17 7 32.6	1.6	16.7	1.24	27	16 58	9 22 52.02	16 3 20.2	1.8	19.1	1.41
13	19 39	9 7 0.61	17 5 12.5	1.6	16.8	1.24	28	16 54	9 22 57.31	16 3 9.9	1.8	19.2	1.42
14	19 36	9 7 34.92	17 2 54.3	1.6	16.8	1.24	29	16 50	9 23 1.82	16 3 3.2	1.8	19.2	1.42
15	19 32	9 8 8.75	+17 0 38.0	1.6	16.9	1.25	30	16 46	9 23 5.57	+16 3 0.1	1.8	19.3	1.43
16	19 29	9 8 42.06	16 58 23.4	1.6	16.9	1.25	Dec. 1	16 42	9 23 8.56	16 3 0.6	1.8	19.4	1.43
17	19 26	9 9 14.84	16 56 10.8	1.6	16.9	1.25	2	16 38	9 23 10.78	16 3 4.7	1.8	19.4	1.44
18	19 22	9 9 47.10	16 54 0.3	1.6	17.0	1.26	3	16 35	9 23 12.23	16 3 12.5	1.8	19.5	1.44
19	19 19	9 10 18.83	16 51 51.9	1.6	17.0	1.26	4	16 31	9 23 12.91	16 3 23.8	1.8	19.5	1.44
20	19 15	9 10 50.02	+16 49 45.5	1.6	17.1	1.26	5	16 27	9 23 12.81	+16 3 38.8	1.8	19.6	1.45
21	19 12	9 11 20.66	16 47 41.4	1.6	17.1	1.27	6	16 23	9 23 11.95	16 3 57.4	1.8	19.6	1.45
22	19 8	9 11 50.75	16 45 39.6	1.6	17.2	1.27	7	16 19	9 23 10.30	16 4 19.6	1.8	19.7	1.46
23	19 5	9 12 20.27	16 43 40.1	1.6	17.2	1.27	8	16 15	9 23 7.89	16 4 45.4	1.8	19.8	1.46
24	19 1	9 12 49.23	16 41 42.9	1.6	17.3	1.28	9	16 11	9 23 4.70	16 5 14.9	1.9	19.8	1.47
25	18 58	9 13 17.62	+16 39 48.0	1.6	17.3	1.28	10	16 7	9 23 0.74	+16 5 48.0	1.9	19.9	1.47
26	18 55	9 13 45.42	16 37 55.5	1.6	17.4	1.29	11	16 3	9 22 56.00	16 6 24.7	1.9	19.9	1.47
27	18 51	9 14 12.65	16 36 5.5	1.6	17.4	1.29	12	15 59	9 22 50.48	16 7 5.0	1.9	20.0	1.48
28	18 48	9 14 39.27	16 34 18.0	1.6	17.5	1.29	13	15 55	9 22 44.20	16 7 48.9	1.9	20.0	1.48
29	18 44	9 15 5.29	16 32 33.0	1.6	17.5	1.30	14	15 51	9 22 37.13	16 8 36.5	1.9	20.1	1.49
30	18 41	9 15 30.70	+16 30 50.6	1.6	17.6	1.30	15	15 47	9 22 29.30	+16 9 27.5	1.9	20.2	1.49
31	18 37	9 15 55.50	16 29 10.9	1.7	17.6	1.30	16	15 43	9 22 20.69	16 10 22.2	1.9	20.2	1.49
Nov. 1	18 34	9 16 19.68	16 27 33.8	1.7	17.7	1.31	17	15 39	9 22 11.32	16 11 20.3	1.9	20.3	1.50
2	18 30	9 16 43.23	16 25 59.4	1.7	17.7	1.31	18	15 34	9 22 1.19	16 12 21.9	1.9	20.3	1.50
3	18 26	9 17 6.17	16 24 27.9	1.7	17.8	1.31	19	15 30	9 21 50.28	16 13 26.9	1.9	20.4	1.51
4	18 23	9 17 28.47	+16 22 59.1	1.7	17.8	1.32	20	15 26	9 21 38.63	+16 14 35.3	1.9	20.4	1.51
5	18 19	9 17 50.12	16 21 33.1	1.7	17.9	1.32	21	15 22	9 21 26.24	16 15 47.1	1.9	20.5	1.51
6	18 16	9 18 11.12	16 20 10.1	1.7	17.9	1.33	22	15 18	9 21 13.11	16 17 2.2	1.9	20.5	1.52
7	18 12	9 18 31.47	16 18 49.9	1.7	18.0	1.33	23	15 14	9 20 59.24	16 18 20.7	1.9	20.6	1.52
8	18 9	9 18 51.17	16 17 32.6	1.7	18.1	1.34	24	15 10	9 20 44.64	16 19 42.3	1.9	20.6	1.53
9	18 5	9 19 10.21	+16 16 18.3	1.7	18.1	1.34	25	15 5	9 20 29.33	+16 21 7.1	1.9	20.7	1.53
10	18 1	9 19 28.58	16 15 7.1	1.7	18.2	1.34	26	15 1	9 20 13.30	16 22 35.0	1.9	20.7	1.53
11	17 58	9 19 46.27	16 13 59.1	1.7	18.2	1.35	27	14 57	9 19 56.57	16 24 5.9	1.9	20.8	1.54
12	17 54	9 20 3.26	16 12 54.1	1.7	18.3	1.35	28	14 53	9 19 39.15	16 25 39.8	1.9	20.8	1.54
13	17 50	9 20 19.57	16 11 52.2	1.7	18.3	1.36	29	14 49	9 19 21.06	16 27 16.7	1.9	20.9	1.54
14	17 47	9 20 35.18	+16 10 53.6	1.7	18.4	1.36	30	14 44	9 19 2.30	+16 28 56.4	2.0	20.9	1.55
15	17 43	9 20 50.08	+16 9 58.3	1.7	18.4	1.36	31	14 40	9 18 42.89	+16 30 38.9	2.0	21.0	1.55

Stellar magnitude at opposition in January, 1919, −2.2.

SATURN, 1919.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Jan. 0	15 22	10 1 49.29	+13 31 4.0	1.0	9.1	0.68
1	15 18	10 1 40.09	13 32 6.7	1.0	9.1	0.68
2	15 14	10 1 30.51	13 33 11.2	1.0	9.1	0.68
3	15 10	10 1 20.57	13 34 17.7	1.0	9.1	0.69
4	15 6	10 1 10.24	13 35 26.0	1.0	9.1	0.69
5	15 2	10 0 59.56	+13 36 36.1	1.0	9.1	0.69
6	14 57	10 0 48.53	13 37 47.9	1.0	9.2	0.69
7	14 53	10 0 37.15	13 39 1.6	1.0	9.2	0.69
8	14 49	10 0 25.43	13 40 16.8	1.0	9.2	0.69
9	14 45	10 0 13.36	13 41 33.7	1.0	9.2	0.69
10	14 41	10 0 0.96	+13 42 52.2	1.0	9.2	0.69
11	14 37	9 59 48.24	13 44 12.3	1.0	9.2	0.69
12	14 33	9 59 35.20	13 45 33.9	1.0	9.2	0.69
13	14 29	9 59 21.86	13 46 57.0	1.1	9.3	0.70
14	14 24	9 59 8.20	13 48 21.5	1.1	9.3	0.70
15	14 20	9 58 54.25	+13 49 47.4	1.1	9.3	0.70
16	14 16	9 58 40.01	13 51 14.6	1.1	9.3	0.70
17	14 12	9 58 25.49	13 52 43.2	1.1	9.3	0.70
18	14 8	9 58 10.68	13 54 12.9	1.1	9.3	0.70
19	14 4	9 57 55.61	13 55 43.9	1.1	9.3	0.70
20	13 59	9 57 40.28	+13 57 16.1	1.1	9.3	0.70
21	13 55	9 57 24.69	13 58 49.3	1.1	9.3	0.70
22	13 51	9 57 8.86	14 0 23.6	1.1	9.3	0.70
23	13 47	9 56 52.80	14 1 58.9	1.1	9.3	0.70
24	13 43	9 56 36,51	14 3 35.1	1.1	9.4	0.70
25	13 38	9 56 20.01	+14 5 12.3	1.1	9.4	0.70
26	13 34	9 56 3.29	14 6 50.2	1.1	9.4	0.70
27	13 30	9 55 46.37	14 8 29.0	1.1	9.4	0.71
28	13 26	9 55 29.26	14 10 8.6	1.1	9.4	0.71
29	13 21	9 55 11.96	14 11 48.8	1.1	9.4	0.71
30	13 17	9 54 54.50	+14 13 29.6	1.1	9.4	0.71
31	13 13	9 54 36.88	14 15 10.9	1.1	9.4	0.71
Feb. 1	13 9	9 54 19.10	14 16 52.8	1.1	9.4	0.71
2	13 5	9 54 1.20	14 18 35.1	1.1	9.4	0.71
3	13 0	9 53 43.16	14 20 17.8	1.1	9.4	0.71
4	12 56	9 53 24.99	+14 22 0.8	1.1	9.4	0.71
5	12 52	9 53 6.73	14 23 44.0	1.1	9.4	0.71
6	12 48	9 52 48.36	14 25 27.4	1.1	9.4	0.71
7	12 43	9 52 29.92	14 27 11.0	1.1	9.4	0.71
8	12 39	9 52 11.40	14 28 54.6	1.1	9.4	0.71
9	12 35	9 51 52.81	+14 30 38.2	1.1	9.4	0.71
10	12 31	9 51 34.17	14 32 21.8	1.1	9.4	0.71
11	12 26	9 51 15.48	14 34 5.2	1.1	9.4	0.71
12	12 22	9 50 56.76	14 35 48.6	1.1	9.4	0.71
13	12 18	9 50 38.02	14 37 31.8	1.1	9.4	0.71
14	12 14	9 50 19.27	+14 39 14.6	1.1	9.4	0.71
15	*12 9*	9 50 0.52	+14 40 57.1	1.1	9.4	0.71
Feb. 15	12 9	9 50 0.52	+14 40 57.1	1.1	9.4	0.71
16	12 5	9 49 41.77	14 42 39.4	1.1	9.4	0.71
17	12 1	9 49 23.03	14 44 21.2	1.1	9.4	0.71
18	11 57	9 49 4.33	14 46 2.6	1.1	9.4	0.71
19	11 52	9 48 45.67	14 47 43.4	1.1	9.4	0.71
20	11 48	9 48 27.05	+14 49 23.6	1.1	9.4	0.71
21	11 44	9 48 8.49	14 51 3.3	1.1	9.4	0.71
22	11 40	9 47 50.01	14 52 42.3	1.1	9.4	0.71
23	11 35	9 47 31.60	14 54 20.4	1.1	9.4	0.71
24	11 31	9 47 13.29	14 55 57.8	1.1	9.4	0.71
25	11 27	9 46 55.07	+14 57 34.4	1.1	9.4	0.71
26	11 23	9 46 36.97	14 59 10.3	1.1	9.4	0.71
27	11 19	9 46 18.99	15 0 44.8	1.1	9.4	0.71
28	11 14	9 46 1.14	15 2 18.8	1.1	9.4	0.71
Mar. 1	11 10	9 45 43.42	15 3 51.4	1.1	9.4	0.71
2	11 6	9 45 25.88	+15 5 23.0	1.1	9.4	0.71
3	11 2	9 45 8.49	15 6 53.5	1.1	9.4	0.71
4	10 57	9 44 51.28	15 8 22.7	1.1	9.4	0.71
5	10 53	9 44 34.26	15 9 50.6	1.1	9.4	0.71
6	10 49	9 44 17.42	15 11 17.3	1.1	9.4	0.71
7	10 45	9 44 0.80	+15 12 42.8	1.1	9.3	0.71
8	10 41	9 43 44.38	15 14 6.9	1.1	9.3	0.71
9	10 36	9 43 28.19	15 15 29.6	1.1	9.3	0.71
10	10 32	9 43 12.22	15 16 50.9	1.1	9.3	0.70
11	10 28	9 42 56.49	15 18 10.7	1.1	9.3	0.70
12	10 24	9 42 41.02	+15 19 28.9	1.1	9.3	0.70
13	10 20	9 42 25.79	15 20 45.7	1.1	9.3	0.70
14	10 15	9 42 10.83	15 22 1.0	1.1	9.3	0.70
15	10 11	9 41 56.13	15 23 14.5	1.1	9.3	0.70
16	10 7	9 41 41.72	15 24 26.5	1.1	9.3	0.70
17	10 3	9 41 27.57	+15 25 36.8	1.0	9.3	0.70
18	9 59	9 41 13.71	15 26 45.4	1.0	9.2	0.70
19	9 55	9 41 0.15	15 27 52.4	1.0	9.2	0.70
20	9 50	9 40 46.90	15 28 57.5	1.0	9.2	0.70
21	9 46	9 40 33.96	15 30 0.9	1.0	9.2	0.70
22	9 42	9 40 21.33	+15 31 2.6	1.0	9.2	0.70
23	9 38	9 40 9.02	15 32 2.4	1.0	9.2	0.70
24	9 34	9 39 57.06	15 33 0.4	1.0	9.2	0.70
25	9 30	9 39 45.42	15 33 56.5	1.0	9.2	0.69
26	9 26	9 39 34.11	15 34 50.7	1.0	9.2	0.69
27	9 22	9 39 23.15	+15 35 43.0	1.0	9.1	0.69
28	9 17	9 39 12.56	15 36 33.5	1.0	9.1	0.69
29	9 13	9 39 2.32	15 37 21.9	1.0	9.1	0.69
30	9 9	9 38 52.45	15 38 8.3	1.0	9.1	0.69
31	9 5	9 38 42.94	15 38 52.7	1.0	9.1	0.69
Apr. 1	9 1	9 38 33.80	+15 39 35.2	1.0	9.1	0.69
2	8 57	9 38 25.03	+15 40 15.7	1.0	9.1	0.69

Stellar magnitude at opposition in February, 1919, +0.2.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	9 1	9 38 33.80	+15 39 35.2	1.0	9.1	0.69	Nov. 15	19 12	10 50 19.81	+9 8 19.8	0.9	8.1	0.60
2	8 57	9 38 25.03	15 40 15.7	1.0	9.1	0.69	16	19 9	10 50 34.39	9 7 6.0	0.9	8.1	0.60
3	8 53	9 38 16.65	15 40 54.0	1.0	9.0	0.69	17	19 5	10 50 48.63	9 5 54.5	0.9	8.2	0.60
4	8 49	9 38 8.66	15 41 30.4	1.0	9.0	0.69	18	19 1	10 51 2.51	9 4 45.0	0.9	8.2	0.60
5	8 45	9 38 1.07	15 42 4.6	1.0	9.0	0.68	19	18 57	10 51 16.05	9 3 37.9	0.9	8.2	0.60
6	8 41	9 37 53.86	+15 42 36.8	1.0	9.0	0.68	20	18 54	10 51 29.23	+9 2 32.9	0.9	8.2	0.61
7	8 37	9 37 47.05	15 43 7.0	1.0	9.0	0.68	21	18 50	10 51 42.06	9 1 30.1	0.9	8.2	0.61
8	8 33	9 37 40.64	15 43 35.1	1.0	9.0	0.68	22	18 46	10 51 54.52	9 0 29.6	0.9	8.2	0.61
9	8 29	9 37 34.64	15 44 1.1	1.0	9.0	0.68	23	18 43	10 52 6.61	8 59 31.4	0.9	8.2	0.61
10	8 25	9 37 29.03	15 44 25.0	1.0	8.9	0.68	24	18 39	10 52 18.33	8 58 35.5	0.9	8.3	0.61
11	8 21	9 37 23.83	+15 44 46.8	1.0	8.9	0.68	25	18 35	10 52 29.69	+8 57 42.0	0.9	8.3	0.61
12	8 17	9 37 19.04	15 45 6.6	1.0	8.9	0.68	26	18 31	10 52 40.68	8 56 50.8	0.9	8.3	0.61
13	8 13	9 37 14.65	15 45 24.2	1.0	8.9	0.68	27	18 28	10 52 51.29	8 56 1.9	0.9	8.3	0.61
14	8 9	9 37 10.67	15 45 39.6	1.0	8.9	0.67	28	18 24	10 53 1.52	8 55 15.4	0.9	8.3	0.61
15	8 5	9 37 7.10	15 45 53.1	1.0	8.9	0.67	29	18 20	10 53 11.37	8 54 31.4	0.9	8.3	0.62
16	8 1	9 37 3.95	+15 46 4.3	1.0	8.9	0.67	30	18 16	10 53 20.83	+8 53 49.6	0.9	8.3	0.62
17	7 57	9 37 1.20	15 46 13.6	1.0	8.8	0.67	Dec. 1	18 12	10 53 29.91	8 53 10.3	0.9	8.4	0.62
18	7 53	9 36 58.87	15 46 20.6	1.0	8.8	0.67	2	18 9	10 53 38.60	8 52 33.3	0.9	8.4	0.62
19	7 49	9 36 56.96	15 46 25.7	1.0	8.8	0.67	3	18 5	10 53 46.90	8 51 58.8	1.0	8.4	0.62
20	7 45	9 36 55.46	15 46 28.7	1.0	8.8	0.67	4	18 1	10 53 54.81	8 51 26.8	1.0	8.4	0.62
21	7 41	9 36 54.38	+15 46 29.5	1.0	8.8	0.67	5	17 57	10 54 2.33	+8 50 57.2	1.0	8.4	0.62
22	7 37	9 36 53.71	15 46 28.1	1.0	8.8	0.67	6	17 53	10 54 9.45	8 50 30.0	1.0	8.4	0.62
23	7 33	9 36 53.46	15 46 24.8	1.0	8.7	0.66	7	17 50	10 54 16.18	8 50 5.3	1.0	8.4	0.62
24	7 29	9 36 53.63	15 46 19.3	1.0	8.7	0.66	8	17 46	10 54 22.50	8 49 43.2	1.0	8.5	0.62
25	7 25	9 36 54.23	15 46 11.7	1.0	8.7	0.66	9	17 42	10 54 28.43	8 49 23.5	1.0	8.5	0.63
26	7 21	9 36 55.24	+15 46 1.8	1.0	8.7	0.66	10	17 38	10 54 33.96	+8 49 6.2	1.0	8.5	0.63
27	7 17	9 36 56.67	15 45 50.0	1.0	8.7	0.66	11	17 34	10 54 39.07	8 48 51.6	1.0	8.5	0.63
28	7 13	9 36 58.52	15 45 35.9	1.0	8.7	0.66	12	17 30	10 54 43.79	8 48 39.4	1.0	8.5	0.63
29	7 9	9 37 0.79	15 45 19.9	1.0	8.7	0.66	13	17 27	10 54 48.10	8 48 29.8	1.0	8.5	0.63
30	7 6	9 37 3.48	15 45 1.8	1.0	8.6	0.66	14	17 23	10 54 51.99	8 48 22.7	1.0	8.5	0.63
May 1	7 2	9 37 6.59	+15 44 41.6	1.0	8.6	0.65	15	17 19	10 54 55.47	+8 48 18.1	1.0	8.6	0.63
2	6 58	9 37 10.11	15 44 19.4	1.0	8.6	0.65	16	17 15	10 54 58.54	8 48 16.2	1.0	8.6	0.63
3	6 54	9 37 14.05	15 43 55.0	1.0	8.6	0.65	17	17 11	10 55 1.19	8 48 16.7	1.0	8.6	0.63
4	6 50	9 37 18.41	15 43 28.6	1.0	8.6	0.65	18	17 7	10 55 3.43	8 48 19.8	1.0	8.6	0.64
5	6 46	9 37 23.17	15 43 0.1	1.0	8.6	0.65	19	17 3	10 55 5.25	8 48 25.4	1.0	8.6	0.64
6	6 42	9 37 28.34	+15 42 29.6	1.0	8.5	0.65	x 20	16 59	10 55 6.66	+8 48 33.7	1.0	8.6	0.64
7	6 38	9 37 33.93	15 41 57.1	1.0	8.5	0.65	21	16 55	10 55 7.65	8 48 44.4	1.0	8.6	0.64
8	6 35	9 37 39.92	15 41 22.5	1.0	8.5	0.65	22	16 52	10 55 8.22	8 48 57.7	1.0	8.7	0.64
9	6 31	9 37 46.31	15 40 46.0	1.0	8.5	0.64	23	16 48	10 55 8.37	8 49 13.5	1.0	8.7	0.64
	. . . .	. . . .	. . . .	. .	. .	. . .	24	16 44	10 55 8.11	8 49 31.8	1.0	8.7	0.64
Nov. 9	19 34	10 48 45.36	+ 9 16 25.8	0.9	8.0	0.59	25	16 40	10 55 7.43	+8 49 52.7	1.0	8.7	0.64
10	19 31	10 49 1.92	9 14 59.7	0.9	8.1	0.60	26	16 36	10 55 6.34	8 50 16.0	1.0	8.7	0.65
11	19 27	10 49 18.15	9 13 35.6	0.9	8.1	0.60	27	16 32	10 55 4.84	8 50 41.9	1.0	8.7	0.65
12	19 23	10 49 34.06	9 12 13.4	0.9	8.1	0.60	28	16 28	10 55 2.93	8 51 10.3	1.0	8.8	0.65
13	19 20	10 49 49.65	9 10 53.5	0.9	8.1	0.60	29	16 24	10 55 0.60	8 51 41.1	1.0	8.8	0.65
14	19 16	10 50 4.90	+ 9 9 35.5	0.9	8.1	0.60	30	16 20	10 54 57.86	+8 52 14.4	1.0	8.8	0.65
15	19 12	10 50 19.81	+ 9 8 19.8	0.9	8.1	0.60	31	16 16	10 54 54.72	+8 52 50.1	1.0	[illegible]	

Stellar magnitude at opposition in February, 1919, +0.2.

URANUS, 1919.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
June 11	16 57	22 15 54.69	−11 35 17.7	0.4	1.7	0.12	July 27	13 53	22 12 17.83	−11 57 5.0	0.5	1.8	0.12
12	16 53	22 15 53.63	11 35 26.1	0.4	1.7	0.12	28	13 49	22 12 9.98	11 57 50.0	0.5	1.8	0.12
13	16 49	22 15 52.39	11 35 35.6	0.4	1.7	0.12	29	13 45	22 12 2.04	11 58 35.5	0.5	1.8	0.12
14	16 45	22 15 50.98	11 35 46.0	0.4	1.7	0.12	30	13 41	22 11 54.00	11 59 21.3	0.5	1.8	0.12
15	16 41	22 15 49.38	11 35 57.4	0.4	1.7	0.12	31	13 37	22 11 45.88	12 0 7.6	0.5	1.8	0.12
16	16 37	22 15 47.61	−11 36 9.8	0.4	1.7	0.12	Aug. 1	13 32	22 11 37.68	−12 0 54.3	0.5	1.8	0.12
17	16 33	22 15 45.66	11 36 23.2	0.4	1.7	0.12	2	13 28	22 11 29.40	12 1 41.5	0.5	1.8	0.12
18	16 29	22 15 43.53	11 36 37.6	0.4	1.7	0.12	3	13 24	22 11 21.05	12 2 28.9	0.5	1.8	0.12
19	16 25	22 15 41.23	11 36 53.0	0.4	1.7	0.12	4	13 20	22 11 12.62	12 3 16.7	0.5	1.8	0.12
20	16 22	22 15 38.74	11 37 9.3	0.4	1.7	0.12	5	13 16	22 11 4.12	12 4 4.9	0.5	1.8	0.12
21	16 18	22 15 36.09	−11 37 26.7	0.5	1.7	0.12	6	13 12	22 10 55.55	−12 4 53.3	0.5	1.8	0.12
22	16 14	22 15 33.26	11 37 44.9	0.5	1.7	0.12	7	13 8	22 10 46.93	12 5 42.0	0.5	1.8	0.12
23	16 10	22 15 30.25	11 38 4.2	0.5	1.7	0.12	8	13 4	22 10 38.25	12 6 30.9	0.5	1.8	0.12
24	16 6	22 15 27.08	11 38 24.3	0.5	1.7	0.12	9	13 0	22 10 29.52	12 7 20.0	0.5	1.8	0.12
25	16 2	22 15 23.73	11 38 45.4	0.5	1.7	0.12	10	12 56	22 10 20.72	12 8 9.5	0.5	1.8	0.12
26	15 58	22 15 20.21	−11 39 7.5	0.5	1.7	0.12	11	12 52	22 10 11.87	−12 8 59.1	0.5	1.8	0.12
27	15 54	22 15 16.53	11 39 30.4	0.5	1.7	0.12	12	12 48	22 10 2.99	12 9 49.0	0.5	1.8	0.12
28	15 50	22 15 12.68	11 39 54.3	0.5	1.7	0.12	13	12 43	22 9 54.06	12 10 39.0	0.5	1.8	0.12
29	15 46	22 15 8.66	11 40 19.1	0.5	1.7	0.12	14	12 39	22 9 45.10	12 11 29.1	0.5	1.8	0.12
30	15 42	22 15 4.49	11 40 44.8	0.5	1.7	0.12	15	12 35	22 9 36.09	12 12 19.4	0.5	1.8	0.12
July 1	15 38	22 15 0.15	−11 41 11.3	0.5	1.7	0.12	16	12 31	22 9 27.06	−12 13 9.8	0.5	1.8	0.12
2	15 34	22 14 55.65	11 41 38.7	0.5	1.7	0.12	17	12 27	22 9 18.00	12 14 0.2	0.5	1.8	0.12
3	15 30	22 14 51.00	11 42 6.9	0.5	1.7	0.12	18	12 23	22 9 8.91	12 14 50.7	0.5	1.8	0.12
4	15 26	22 14 46.19	11 42 36.0	0.5	1.7	0.12	19	12 19	22 8 59.81	12 15 41.3	0.5	1.8	0.12
5	15 22	22 14 41.23	11 43 5.9	0.5	1.7	0.12	20	12 15	22 8 50.69	12 16 31.9	0.5	1.8	0.12
6	15 18	22 14 36.13	−11 43 36.6	0.5	1.7	0.12	21	12 11	22 8 41.54	−12 17 22.5	0.5	1.8	0.12
7	15 14	22 14 30.87	11 44 8.1	0.5	1.7	0.12	22	12 7	22 8 32.40	12 18 13.1	0.5	1.8	0.12
8	15 10	22 14 25.46	11 44 40.4	0.5	1.7	0.12	23	12 3	22 8 23.24	12 19 3.6	0.5	1.8	0.12
9	15 6	22 14 19.91	11 45 13.5	0.5	1.7	0.12	24	11 59	22 8 14.08	12 19 54.1	0.5	1.8	0.12
10	15 2	22 14 14.22	11 45 47.3	0.5	1.7	0.12	25	11 54	22 8 4.93	12 20 44.5	0.5	1.8	0.12
11	14 57	22 14 8.38	−11 46 21.9	0.5	1.7	0.12	26	11 50	22 7 55.79	−12 21 34.8	0.5	1.8	0.12
12	14 53	22 14 2.40	11 46 57.2	0.5	1.7	0.12	27	11 46	22 7 46.66	12 22 24.9	0.5	1.8	0.12
13	14 49	22 13 56.30	11 47 33.2	0.5	1.7	0.12	28	11 42	22 7 37.54	12 23 14.9	0.5	1.8	0.12
14	14 45	22 13 50.05	11 48 9.9	0.5	1.7	0.12	29	11 38	22 7 28.43	12 24 4.8	0.5	1.8	0.12
15	14 41	22 13 43.68	11 48 47.3	0.5	1.7	0.12	30	11 34	22 7 19.35	12 24 54.4	0.5	1.8	0.12
16	14 37	22 13 37.18	−11 49 25.4	0.5	1.7	0.12	31	11 30	22 7 10.29	−12 25 43.9	0.5	1.8	0.12
17	14 33	22 13 30.55	11 50 4.2	0.5	1.7	0.12	Sept. 1	11 26	22 7 1.27	12 26 33.0	0.5	1.8	0.12
18	14 29	22 13 23.79	11 50 43.6	0.5	1.7	0.12	2	11 22	22 6 52.29	12 27 21.8	0.5	1.8	0.12
19	14 25	22 13 16.92	11 51 23.6	0.5	1.7	0.12	3	11 18	22 6 43.34	12 28 10.5	0.5	1.8	0.12
20	14 21	22 13 9.92	11 52 4.3	0.5	1.7	0.12	4	11 14	22 6 34.43	12 28 58.9	0.5	1.8	0.12
21	14 17	22 13 2.81	−11 52 45.6	0.5	1.7	0.12	5	11 10	22 6 25.56	−12 29 47.0	0.5	1.8	0.12
22	14 13	22 12 55.58	11 53 27.4	0.5	1.7	0.12	6	11 6	22 6 16.74	12 30 34.7	0.5	1.8	0.12
23	14 9	22 12 48.24	11 54 9.8	0.5	1.7	0.12	7	11 1	22 6 7.97	12 31 22.0	0.5	1.8	0.12
24	14 5	22 12 40.80	11 54 52.8	0.5	1.8	0.12	8	10 57	22 5 59.26	12 32 8.9	0.5	1.8	0.12
25	14 1	22 12 33.25	11 55 36.4	0.5	1.8	0.12	9	10 53	22 5 50.61	12 32 55.5	0.5	1.8	0.12
26	13 57	22 12 25.59	−11 56 20.5	0.5	1.8	0.12	10	10 49	22 5 42.02	−12 33 41.7	0.5	1.8	0.12
27	13 53	22 12 17.83	−11 57 5.0	0.5	1.8	0.12	11	10 45	22 5 33.49	−12 34 27.6	0.5	1.8	0.12

Stellar magnitude at opposition in August, 1919, 6.1.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Sept. 11	10 45	22 5 33.49	−12 34 27.6	0.5	1.8	0.12
12	10 41	22 5 25.04	12 35 13.0	0.5	1.8	0.12
13	10 37	22 5 16.65	12 35 57.9	0.5	1.8	0.12
14	10 33	22 5 8.34	12 36 42.3	0.5	1.8	0.12
15	10 29	22 5 0.12	12 37 26.3	0.5	1.8	0.12
16	10 25	22 4 51.97	−12 38 9.7	0.5	1.8	0.12
17	10 21	22 4 43.91	12 38 52.5	0.5	1.8	0.12
18	10 17	22 4 35.95	12 39 34.8	0.5	1.8	0.12
19	10 13	22 4 28.07	12 40 16.6	0.5	1.8	0.12
20	10 9	22 4 20.29	12 40 57.7	0.5	1.8	0.12
21	10 4	22 4 12.61	−12 41 38.2	0.5	1.8	0.12
22	10 0	22 4 5.04	12 42 18.2	0.5	1.8	0.12
23	9 56	22 3 57.57	12 42 57.4	0.5	1.7	0.12
24	9 52	22 3 50.21	12 43 36.1	0.5	1.7	0.12
25	9 48	22 3 42.97	12 44 14.1	0.5	1.7	0.12
26	9 44	22 3 35.84	−12 44 51.4	0.5	1.7	0.12
27	9 40	22 3 28.84	12 45 28.0	0.5	1.7	0.12
28	9 36	22 3 21.96	12 46 3.8	0.5	1.7	0.12
29	9 32	22 3 15.21	12 46 38.9	0.5	1.7	0.12
30	9 28	22 3 8.58	12 47 13.3	0.5	1.7	0.12
Oct. 1	9 24	22 3 2.09	−12 47 46.9	0.5	1.7	0.12
2	9 20	22 2 55.73	12 48 19.7	0.5	1.7	0.12
3	9 16	22 2 49.51	12 48 51.7	0.5	1.7	0.12
4	9 12	22 2 43.43	12 49 22.9	0.5	1.7	0.12
5	9 8	22 2 37.49	12 49 53.3	0.5	1.7	0.12
6	9 4	22 2 31.70	−12 50 23.0	0.5	1.7	0.12
7	9 0	22 2 26.06	12 50 51.7	0.5	1.7	0.12
8	8 56	22 2 20.57	12 51 19.6	0.5	1.7	0.12
9	8 52	22 2 15.23	12 51 46.6	0.5	1.7	0.12
10	8 48	22 2 10.04	12 52 12.7	0.5	1.7	0.12
11	8 44	22 2 5.02	−12 52 38.1	0.5	1.7	0.12
12	8 40	22 2 0.14	12 53 2.5	0.5	1.7	0.12
13	8 36	22 1 55.41	12 53 26.0	0.5	1.7	0.12
14	8 32	22 1 50.86	12 53 48.7	0.5	1.7	0.12
15	8 28	22 1 46.47	12 54 10.4	0.5	1.7	0.12
16	8 24	22 1 42.25	−12 54 31.1	0.5	1.7	0.12
17	8 20	22 1 38.21	12 54 50.9	0.5	1.7	0.12
18	8 16	22 1 34.33	12 55 9.8	0.5	1.7	0.12
19	8 12	22 1 30.62	12 55 27.7	0.5	1.7	0.12
20	8 8	22 1 27.08	12 55 44.6	0.5	1.7	0.12
21	8 4	22 1 23.73	−12 56 0.5	0.5	1.7	0.12
22	8 0	22 1 20.56	12 56 15.5	0.5	1.7	0.12
23	7 56	22 1 17.56	12 56 29.5	0.5	1.7	0.12
24	7 52	22 1 14.74	12 56 42.4	0.5	1.7	0.12
25	7 48	22 1 12.11	12 56 54.4	0.5	1.7	0.12
26	7 44	22 1 9.67	−12 57 5.3	0.5	1.7	0.12
27	7 40	22 1 7.41	−12 57 15.1	0.5	1.7	0.12
Oct. 27	7 40	22 1 7.41	−12 57 15.1	0.5	1.7	0.12
28	7 36	22 1 5.34	12 57 24.1	0.5	1.7	0.12
29	7 32	22 1 3.45	12 57 32.1	0.5	1.7	0.12
30	7 28	22 1 1.76	12 57 38.9	0.5	1.7	0.12
31	7 24	22 1 0.25	12 57 44.6	0.5	1.7	0.12
Nov. 1	7 20	22 0 58.94	−12 57 49.4	0.5	1.7	0.12
2	7 16	22 0 57.82	12 57 53.2	0.5	1.7	0.12
3	7 12	22 0 56.90	12 57 55.9	0.5	1.7	0.12
4	7 8	22 0 56.16	12 57 57.4	0.5	1.7	0.12
5	7 4	22 0 55.62	12 57 58.0	0.5	1.7	0.12
6	7 0	22 0 55.27	−12 57 57.6	0.5	1.7	0.12
7	6 56	22 0 55.11	12 57 56.1	0.4	1.7	0.12
8	6 52	22 0 55.16	12 57 53.4	0.4	1.7	0.12
9	6 49	22 0 55.39	12 57 49.8	0.4	1.7	0.12
10	6 45	22 0 55.82	12 57 45.2	0.4	1.7	0.12
11	6 41	22 0 56.44	−12 57 39.5	0.4	1.7	0.12
12	6 37	22 0 57.26	12 57 32.7	0.4	1.7	0.12
13	6 33	22 0 58.26	12 57 24.9	0.4	1.7	0.12
14	6 29	22 0 59.47	12 57 16.0	0.4	1.7	0.12
15	6 25	22 1 0.89	12 57 6.1	0.4	1.7	0.12
16	6 21	22 1 2.49	−12 56 55.1	0.4	1.7	0.12
17	6 17	22 1 4.29	12 56 43.0	0.4	1.7	0.12
18	6 13	22 1 6.28	12 56 29.9	0.4	1.7	0.12
19	6 9	22 1 8.48	12 56 15.6	0.4	1.7	0.12
20	6 6	22 1 10.87	12 56 0.3	0.4	1.7	0.11
21	6 2	22 1 13.45	−12 55 44.1	0.4	1.7	0.11
22	5 58	22 1 16.23	12 55 26.7	0.4	1.7	0.11
23	5 54	22 1 19.21	12 55 8.3	0.4	1.7	0.11
24	5 50	22 1 22.38	12 54 48.8	0.4	1.7	0.11
25	5 46	22 1 25.75	12 54 28.3	0.4	1.7	0.11
26	5 42	22 1 29.31	−12 54 6.8	0.4	1.7	0.11
27	5 38	22 1 33.06	12 53 44.3	0.4	1.7	0.11
28	5 35	22 1 37.00	12 53 20.8	0.4	1.7	0.11
29	5 31	22 1 41.13	12 52 56.1	0.4	1.7	0.11
30	5 27	22 1 45.45	12 52 30.4	0.4	1.7	0.11
Dec. 1	5 23	22 1 49.96	−12 52 3.8	0.4	1.7	0.11
2	5 19	22 1 54.66	12 51 36.2	0.4	1.7	0.11
3	5 15	22 1 59.54	12 51 7.6	0.4	1.7	0.11
4	5 11	22 2 4.61	12 50 38.0	0.4	1.7	0.11
5	5 8	22 2 9.86	12 50 7.4	0.4	1.7	0.11
6	5 4	22 2 15.29	−12 49 35.9	0.4	1.7	0.11
7	5 0	22 2 20.90	12 49 3.4	0.4	1.7	0.11
8	4 56	22 2 26.70	12 48 29.8	0.4	1.7	0.11
9	4 52	22 2 32.66	12 47 55.3	0.4	1.6	0.11
10	4 48	22 2 38.81	12 47 19.9	0.4	1.6	0.11
11	4 45	22 2 45.13	−12 46 43.6	0.4	1.6	0.11
12	4 41	22 2 51.63	−12 46 6.3	0.4	1.6	0.11

Stellar magnitude at opposition in August, 1919, 6.1.

NEPTUNE, 1919.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Jan. 0	14 5	8 44 19.64	+18 0 7.5	0.3	1.3	0.09
1	14 1	8 44 13.83	18 0 30.6	0.3	1.3	0.09
2	13 57	8 44 7.95	18 0 53.9	0.3	1.3	0.09
3	13 53	8 44 2.00	18 1 17.6	0.3	1.3	0.09
4	13 49	8 43 55.98	18 1 41.4	0.3	1.3	0.09
5	13 45	8 43 49.89	+18 2 5.5	0.3	1.3	0.09
6	13 41	8 43 43.74	18 2 29.8	0.3	1.3	0.09
7	13 37	8 43 37.53	18 2 54.4	0.3	1.3	0.09
8	13 32	8 43 31.26	18 3 19.1	0.3	1.3	0.09
9	13 28	8 43 24.94	18 3 44.1	0.3	1.3	0.09
10	13 24	8 43 18.57	+18 4 9.2	0.3	1.3	0.09
11	13 20	8 43 12.15	18 4 34.5	0.3	1.3	0.09
12	13 16	8 43 5.68	18 5 0.0	0.3	1.3	0.09
13	13 12	8 42 59.18	18 5 25.6	0.3	1.3	0.09
14	13 8	8 42 52.64	18 5 51.3	0.3	1.3	0.09
15	13 4	8 42 46.05	+18 6 17.3	0.3	1.3	0.09
16	13 0	8 42 39.43	18 6 43.3	0.3	1.3	0.09
17	12 56	8 42 32.77	18 7 9.3	0.3	1.3	0.09
18	12 52	8 42 26.08	18 7 35.6	0.3	1.3	0.09
19	12 48	8 42 19.36	18 8 2.0	0.3	1.3	0.09
20	12 44	8 42 12.62	+18 8 28.4	0.3	1.3	0.09
21	12 40	8 42 5.86	18 8 54.9	0.3	1.3	0.09
22	12 36	8 41 59.07	18 9 21.4	0.3	1.3	0.09
23	12 32	8 41 52.26	18 9 48.1	0.3	1.3	0.09
24	12 28	8 41 45.45	18 10 14.8	0.3	1.3	0.09
25	12 24	8 41 38.63	+18 10 41.5	0.3	1.3	0.09
26	12 20	8 41 31.78	18 11 8.2	0.3	1.3	0.09
27	12 16	8 41 24.93	18 11 34.9	0.3	1.3	0.09
28	12 12	8 41 18.08	18 12 1.6	0.3	1.3	0.09
29	12 8	8 41 11.23	18 12 28.4	0.3	1.3	0.09
30	12 4	8 41 4.38	+18 12 55.1	0.3	1.3	0.09
31	12 0	8 40 57.55	18 13 21.8	0.3	1.3	0.09
Feb. 1	11 55	8 40 50.72	18 13 48.5	0.3	1.3	0.09
2	11 51	8 40 43.90	18 14 15.1	0.3	1.3	0.09
3	11 47	8 40 37.09	18 14 41.6	0.3	1.3	0.09
4	11 43	8 40 30.30	+18 15 8.0	0.3	1.3	0.09
5	11 39	8 40 23.52	18 15 34.3	0.3	1.3	0.09
6	11 35	8 40 16.77	18 16 0.5	0.3	1.3	0.09
7	11 31	8 40 10.05	18 16 26.7	0.3	1.3	0.09
8	11 27	8 40 3.36	18 16 52.7	0.3	1.3	0.09
9	11 23	8 39 56.69	+18 17 18.5	0.3	1.3	0.09
10	11 19	8 39 50.06	18 17 44.2	0.3	1.3	0.09
11	11 15	8 39 43.47	18 18 9.8	0.3	1.3	0.09
12	11 11	8 39 36.91	18 18 35.2	0.3	1.3	0.09
13	11 7	8 39 30.39	18 19 0.5	0.3	1.3	0.09
14	11 3	8 39 23.92	+18 19 25.5	0.3	1.3	0.09
15	10 59	8 39 17.50	+18 19 50.4	0.3	1.3	0.09
Feb. 15	10 59	8 39 17.50	+18 19 50.4	0.3	1.3	0.09
16	10 55	8 39 11.12	18 20 15.2	0.3	1.3	0.09
17	10 51	8 39 4.80	18 20 39.7	0.3	1.3	0.09
18	10 47	8 38 58.52	18 21 4.0	0.3	1.3	0.09
19	10 43	8 38 52.30	18 21 28.0	0.3	1.3	0.09
20	10 39	8 38 46.15	+18 21 51.9	0.3	1.3	0.09
21	10 35	8 38 40.05	18 22 15.5	0.3	1.3	0.09
22	10 31	8 38 34.01	18 22 38.9	0.3	1.3	0.09
23	10 27	8 38 28.04	18 23 2.0	0.3	1.3	0.09
24	10 23	8 38 22.13	18 23 24.9	0.3	1.3	0.09
25	10 19	8 38 16.30	+18 23 47.4	0.3	1.3	0.09
26	10 15	8 38 10.54	18 24 9.7	0.3	1.3	0.09
27	10 11	8 38 4.86	18 24 31.7	0.3	1.3	0.09
28	10 6	8 37 59.25	18 24 53.4	0.3	1.3	0.09
Mar. 1	10 2	8 37 53.72	18 25 14.8	0.3	1.3	0.09
2	9 58	8 37 48.28	+18 25 35.9	0.3	1.3	0.09
3	9 54	8 37 42.92	18 25 56.6	0.3	1.3	0.09
4	9 50	8 37 37.64	18 26 17.1	0.3	1.3	0.09
5	9 46	8 37 32.46	18 26 37.2	0.3	1.3	0.09
6	9 42	8 37 27.36	18 26 56.9	0.3	1.3	0.09
7	9 38	8 37 22.36	+18 27 16.2	0.3	1.3	0.09
8	9 34	8 37 17.46	18 27 35.2	0.3	1.3	0.09
9	9 30	8 37 12.65	18 27 53.9	0.3	1.3	0.09
10	9 26	8 37 7.93	18 28 12.2	0.3	1.3	0.09
11	9 22	8 37 3.32	18 28 30.1	0.3	1.3	0.09
12	9 18	8 36 58.81	+18 28 47.7	0.3	1.3	0.09
13	9 14	8 36 54.41	18 29 4.8	0.3	1.3	0.09
14	9 10	8 36 50.10	18 29 21.5	0.3	1.3	0.09
15	9 6	8 36 45.90	18 29 37.9	0.3	1.3	0.09
16	9 2	8 36 41.81	18 29 53.9	0.3	1.3	0.09
17	8 58	8 36 37.83	+18 30 9.4	0.3	1.3	0.09
18	8 54	8 36 33.96	18 30 24.5	0.3	1.3	0.09
19	8 50	8 36 30.21	18 30 39.2	0.3	1.3	0.09
20	8 46	8 36 26.56	18 30 53.5	0.3	1.3	0.09
21	8 42	8 36 23.02	18 31 7.3	0.3	1.3	0.09
22	8 38	8 36 19.61	+18 31 20.7	0.3	1.3	0.09
23	8 34	8 36 16.31	18 31 33.7	0.3	1.3	0.09
24	8 30	8 36 13.14	18 31 46.3	0.3	1.3	0.09
25	8 26	8 36 10.08	18 31 58.5	0.3	1.3	0.09
26	8 22	8 36 7.14	18 32 10.2	0.3	1.3	0.09
27	8 18	8 36 4.33	+18 32 21.4	0.3	1.3	0.09
28	8 14	8 36 1.64	18 32 32.1	0.3	1.3	0.09
29	8 10	8 35 59.07	18 32 42.4	0.3	1.3	0.09
30	8 6	8 35 56.64	18 32 52.2	0.3	1.3	0.09
31	8 2	8 35 54.33	18 33 1.6	0.3	1.3	0.09
Apr. 1	7 58	8 35 52.14	+18 33 10.5	0.3	1.3	0.09
2	7 55	8 35 50.08	+18 33 18.9	0.3	1.3	0.09

Stellar magnitude at opposition in January, 1919, 7.7.

NEPTUNE, 1919.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Apr. 1	7 58	8 35 52.14	+18 33 10.5	0.3	1.3	0.09
2	7 55	8 35 50.08	18 33 18.9	0.3	1.3	0.09
3	7 51	8 35 48.16	18 33 26.7	0.3	1.3	0.09
4	7 47	8 35 46.37	18 33 34.1	0.3	1.3	0.09
5	7 43	8 35 44.70	18 33 41.0	0.3	1.3	0.09
6	7 39	8 35 43.17	+18 33 47.5	0.3	1.3	0.09
7	7 35	8 35 41.77	18 33 53.4	0.3	1.3	0.09
8	7 31	8 35 40.51	18 33 58.9	0.3	1.3	0.09
9	7 27	8 35 39.37	18 34 3.9	0.3	1.3	0.09
10	7 23	8 35 38.37	18 34 8.4	0.3	1.3	0.09
11	7 19	8 35 37.51	+18 34 12.4	0.3	1.3	0.09
12	7 15	8 35 36.77	18 34 16.0	0.3	1.3	0.09
13	7 11	8 35 36.17	18 34 19.0	0.3	1.3	0.09
14	7 7	8 35 35.70	18 34 21.6	0.3	1.3	0.09
15	7 3	8 35 35.37	18 34 23.7	0.3	1.3	0.09
16	6 59	8 35 35.17	+18 34 25.3	0.3	1.3	0.09
17	6 55	8 35 35.11	18 34 26.3	0.3	1.3	0.09
18	6 51	8 35 35.19	18 34 26.9	0.3	1.3	0.09
19	6 47	8 35 35.39	18 34 27.0	0.3	1.3	0.09
20	6 44	8 35 35.73	18 34 26.6	0.3	1.3	0.09
21	6 40	8 35 36.20	+18 34 25.7	0.3	1.3	0.09
22	6 36	8 35 36.81	18 34 24.2	0.3	1.3	0.09
23	6 32	8 35 37.56	18 34 22.2	0.3	1.3	0.09
24	6 28	8 35 38.44	18 34 19.8	0.3	1.3	0.09
	. . . .	. . . .	. . . .	. .	. .	. . .
Oct. 25	18 40	8 55 33.08	+17 18 59.6	0.3	1.3	0.09
26	18 36	8 55 35.67	17 18 49.6	0.3	1.3	0.09
27	18 33	8 55 38.12	17 18 40.1	0.3	1.3	0.09
28	18 29	8 55 40.44	17 18 31.1	0.3	1.3	0.09
29	18 25	8 55 42.62	17 18 22.7	0.3	1.3	0.09
30	18 21	8 55 44.67	+17 18 14.8	0.3	1.3	0.09
31	18 17	8 55 46.59	17 18 7.5	0.3	1.3	0.09
Nov. 1	18 13	8 55 48.37	17 18 0.8	0.3	1.3	0.09
2	18 9	8 55 50.02	17 17 54.6	0.3	1.3	0.09
3	18 5	8 55 51.53	17 17 49.0	0.3	1.3	0.09
4	18 1	8 55 52.90	+17 17 44.0	0.3	1.3	0.09
5	17 57	8 55 54.14	17 17 39.5	0.3	1.3	0.09
6	17 54	8 55 55.24	17 17 35.5	0.3	1.3	0.09
7	17 50	8 55 56.21	17 17 32.1	0.3	1.3	0.09
8	17 46	8 55 57.04	17 17 29.3	0.3	1.3	0.09
9	17 42	8 55 57.74	+17 17 27.0	0.3	1.3	0.09
10	17 38	8 55 58.30	17 17 25.3	0.3	1.3	0.09
11	17 34	8 55 58.72	17 17 24.1	0.3	1.3	0.09
12	17 30	8 55 59.00	17 17 23.5	0.3	1.3	0.09
13	17 26	8 55 59.15	17 17 23.5	0.3	1.3	0.09
14	17 22	8 55 59.16	+17 17 24.1	0.3	1.3	0.09
15	17 18	8 55 59.03	+17 17 25.2	0.3	1.3	0.09
Nov. 15	17 18	8 55 59.03	+17 17 25.2	0.3	1.3	0.09
16	17 14	8 55 58.76	17 17 26.9	0.3	1.3	0.09
17	17 10	8 55 58.36	17 17 29.2	0.3	1.3	0.09
18	17 6	8 55 57.82	17 17 32.0	0.3	1.3	0.09
19	17 2	8 55 57.14	17 17 35.4	0.3	1.3	0.09
20	16 58	8 55 56.33	+17 17 39.4	0.3	1.3	0.09
21	16 55	8 55 55.38	17 17 43.9	0.3	1.3	0.09
22	16 51	8 55 54.29	17 17 49.0	0.3	1.3	0.09
23	16 47	8 55 53.07	17 17 54.6	0.3	1.3	0.09
24	16 43	8 55 51.72	17 18 0.8	0.3	1.3	0.09
25	16 39	8 55 50.23	+17 18 7.6	0.3	1.3	0.09
26	16 35	8 55 48.61	17 18 14.9	0.3	1.3	0.09
27	16 31	8 55 46.85	17 18 22.7	0.3	1.3	0.09
28	16 27	8 55 44.97	17 18 31.1	0.3	1.3	0.09
29	16 23	8 55 42.95	17 18 40.0	0.3	1.3	0.09
30	16 19	8 55 40.80	+17 18 49.5	0.3	1.3	0.09
Dec. 1	16 15	8 55 38.52	17 18 59.5	0.3	1.3	0.09
2	16 11	8 55 36.12	17 19 10.0	0.3	1.3	0.09
3	16 7	8 55 33.59	17 19 21.0	0.3	1.3	0.09
4	16 3	8 55 30.94	17 19 32.5	0.3	1.3	0.09
5	15 59	8 55 28.16	+17 19 44.5	0.3	1.3	0.09
6	15 55	8 55 25.27	17 19 57.0	0.3	1.3	0.09
7	15 51	8 55 22.25	17 20 10.0	0.3	1.3	0.09
8	15 47	8 55 19.11	17 20 23.5	0.3	1.3	0.09
9	15 43	8 55 15.85	17 20 37.6	0.3	1.3	0.09
10	15 39	8 55 12.47	+17 20 52.1	0.3	1.3	0.09
11	15 35	8 55 8.97	17 21 7.1	0.3	1.3	0.09
12	15 31	8 55 5.35	17 21 22.6	0.3	1.3	0.09
13	15 27	8 55 1.62	17 21 38.5	0.3	1.3	0.09
14	15 23	8 54 57.77	17 21 54.9	0.3	1.3	0.09
15	15 19	8 54 53.81	+17 22 11.8	0.3	1.3	0.09
16	15 15	8 54 49.74	17 22 29.1	0.3	1.3	0.09
17	15 11	8 54 45.56	17 22 46.9	0.3	1.3	0.09
18	15 7	8 54 41.27	17 23 5.1	0.3	1.3	0.09
19	15 3	8 54 36.88	17 23 23.7	0.3	1.3	0.09
20	14 59	8 54 32.39	+17 23 42.7	0.3	1.3	0.09
21	14 55	8 54 27.79	17 24 2.2	0.3	1.3	0.09
22	14 51	8 54 23.09	17 24 22.1	0.3	1.3	0.09
23	14 47	8 54 18.29	17 24 42.3	0.3	1.3	0.09
24	14 43	8 54 13.40	17 25 3.0	0.3	1.3	0.09
25	14 39	8 54 8.41	+17 25 24.0	0.3	1.3	0.09
26	14 35	8 54 3.33	17 25 45.4	0.3	1.3	0.09
27	14 31	8 53 58.16	17 26 7.1	0.3	1.3	0.09
28	14 27	8 53 52.90	17 26 29.2	0.3	1.3	0.09
29	14 23	8 53 47.56	17 26 51.6	0.3	1.3	0.09
30	14 19	8 53 42.13	+17 27 14.4	0.3	1.3	0.09
31	14 15	8 53 36.62	+17 27 37.3	0.3	1.3	0.09

Stellar magnitude at opposition in January, 1919, 7.7.

PART III.

PHENOMENA.

In the year 1919 there will be three eclipses, two of the Sun and one of the Moon.

I.—*A Total Eclipse of the Sun,* May 28–29, 1919, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, May 29ᵈ 1ʰ 6ᵐ 38ˢ.0

	h m s		s s
Sun and Moon's R. A.	4 21 6.93	Hourly motions	10.17 and 161.66
	° ′ ″		′ ″
Sun's declination	+21 30 15.1	Hourly motion	+ 0 23.9
Moon's declination	+21 12 12.4	Hourly motion	+ 2 49.7
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 46.6
Moon's equa. hor. parallax	61 3.8	Moon's true semidiameter	16 37.5

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
		d h m	° ′	° ′
Eclipse begins	May	28 22 33.5	+63 27	−14 6
Central eclipse begins		28 23 30.1	+75 9	−19 43
Central eclipse at local apparent noon		29 1 6.6	+17 23	+ 4 18
Central eclipse ends		29 2 47.4	−42 27	−12 25
Eclipse ends		29 3 44.0	−30 36	− 6 46

II.—*A Partial Eclipse of the Moon,* November 7, 1919, visible at Washington; the beginning visible generally in Asia except the eastern portion, Europe, Africa, the eastern part of North America, and South America except the extreme western part; the ending visible generally in western Asia, Europe, Africa, South America, and North America except the extreme western part.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, Nov. 7ᵈ 12ʰ 3ᵐ 54ˢ.1

	h m s		s
Sun's right ascension	14 48 16.89	Hourly motion	9.99
Moon's right ascension	2 48 16.89	Hourly motion	155.96
	° ′ ″		′ ″
Sun's declination	−16 12 18.1	Hourly motion	− 0 44.5
Moon's declination	+17 10 9.9	Hourly motion	+ 7 53.9
Sun's equa. hor. parallax	8.9	Sun's true semidiameter	16 8.7
Moon's equa. hor. parallax	61 18.2	Moon's true semidiameter	16 41.4

CIRCUMSTANCES OF THE ECLIPSE.

		d h m	
Moon enters penumbra	Nov.	7 9 33.6	Greenwich Mean Time.
Moon enters umbra		7 10 58.3	
Middle of the eclipse		7 11 44.1	
Moon leaves umbra		7 12 29.9	
Moon leaves penumbra		7 13 55.0	

Contacts of Umbra with Moon's Limb.	Angles of Position from the North Point.	The Moon being in the Zenith in Longitude from Greenwich,	and in Latitude
	°	° ′	° ′
First	143 to E.	−10 42	+17 1
Last	166 to W.	+11 16	+17 13

Magnitude of the eclipse=0.184 (Moon's diameter=1.0).

III.—*An Annular Eclipse of the Sun,* **November 22, 1919, visible at Washington as a partial eclipse.**

ELEMENTS OF THE ECLIPSE.

	d	h	m	s
Greenwich mean time of ☌ in right ascension, November	22	3	7	37.5

	h m s		s s
Sun and Moon's R. A.	15 48 14.18	Hourly motions	10.50 and 124.64
	° ′ ″		′ ″
Sun's declination	−20 0 6.2	Hourly motion	− 0 32.8
Moon's declination	−19 35 28.1	Hourly motion	− 3 42.9
Sun's equa. hor. parallax	8.9	Sun's true semidiameter	16 11.7
Moon's equa. hor. parallax	53 56.8	Moon's true semidiameter	14 41.3

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
		d h m	° ′	° ′
Eclipse begins	November	22 0 14.4	+ 88 35	+22 11
Central eclipse begins		22 1 28.0	+102 31	+31 41
Central eclipse at local apparent noon		22 3 7.6	+ 50 24	+ 7 18
Central eclipse ends		22 5 0.1	− 4 11	+19 11
Eclipse ends		22 6 13.7	+ 10 25	+ 9 33

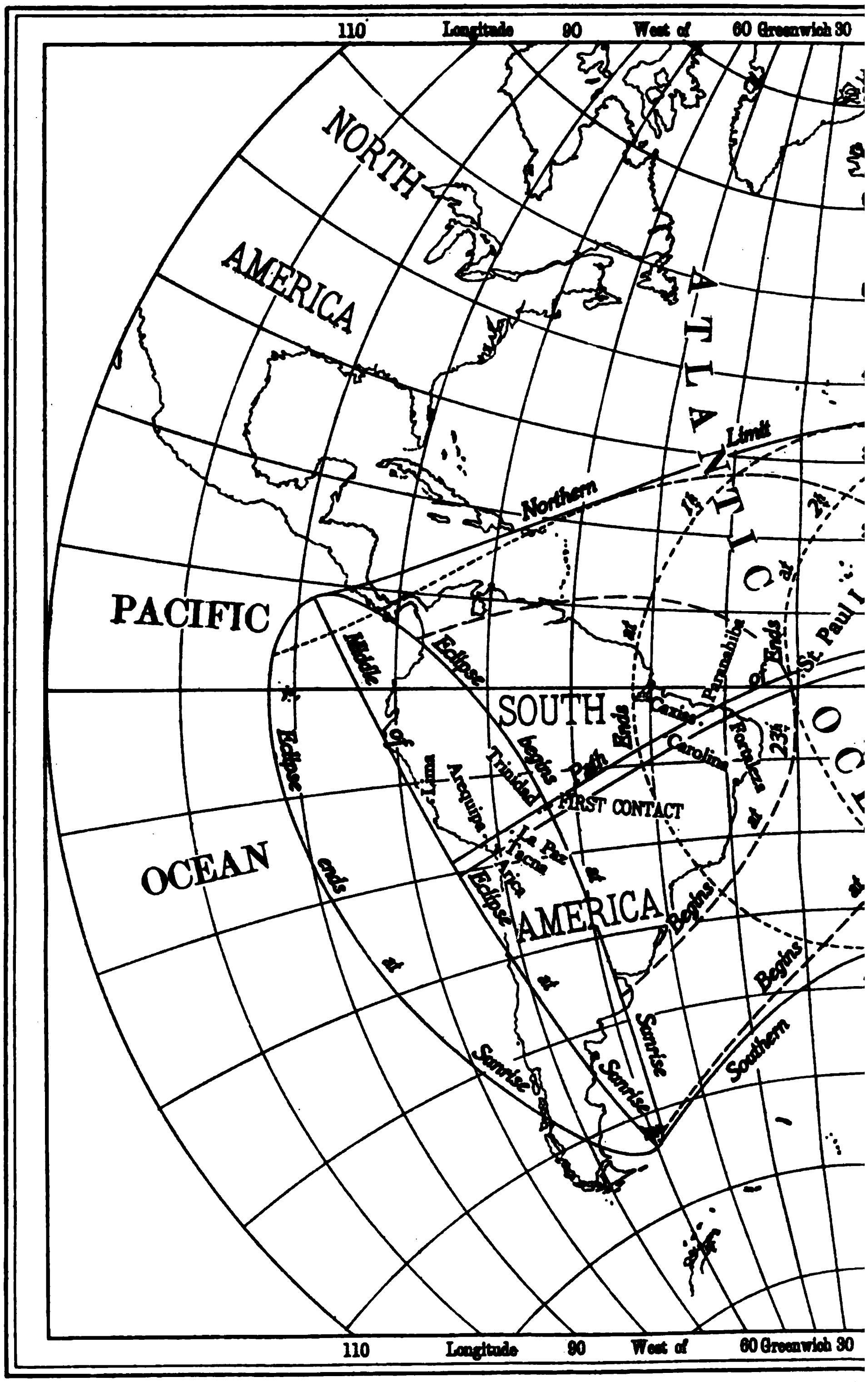
The regions within which the eclipses of the Sun are visible are laid down on the accompanying charts, from which, by means of the dotted lines, the Greenwich mean times of beginning and ending at any place may be found with an uncertainty which will vary from three or four minutes for a high Sun to fifteen or twenty minutes when the Sun is near the horizon.

BESSELIAN ELEMENTS OF THE TOTAL ECLIPSE OF THE SUN, MAY 28–29, 1919.

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Umbra on Fundamental Plane.	
	x	y	Log sin d	Log cos d	μ	l_1	l_2
h m					° ′		
22 30	−1.51297	−0.40113	+9.56384	+9.96871	338 13.8	+0.53172	−0.01412
40	1.41640	0.39438	9.56386	9.96871	340 43.8	0.53174	0.01411
50	1.31982	0.38763	9.56388	9.96870	343 13.8	0.53176	0.01409
23 0	−1.22325	−0.38089	+9.56390	+9.96870	345 43.8	+0.53177	−0.01407
10	1.12666	0.37416	9.56392	9.96870	348 13.8	0.53179	0.01406
20	1.03008	0.36744	9.56394	9.96869	350 43.8	0.53181	0.01404
30	0.93349	0.36073	9.56396	9.96869	353 13.8	0.53182	0.01403
40	0.83690	0.35402	9.56398	9.96869	355 43.8	0.53184	0.01401
50	0.74030	0.34732	9.56400	9.96868	358 13.8	0.53185	0.01400
0 0	−0.64371	−0.34063	+9.56403	+9.96868	0 43.8	+0.53186	−0.01399
10	0.54711	0.33394	9.56405	9.96868	3 13.8	0.53187	0.01397
20	0.45051	0.32727	9.56407	9.96868	5 43.8	0.53188	0.01396
30	0.35391	0.32060	9.56409	9.96868	8 13.8	0.53189	0.01395
40	0.25730	0.31394	9.56411	9.96867	10 43.8	0.53190	0.01394
50	0.16070	0.30728	9.56413	9.96867	13 13.8	0.53191	0.01393
1 0	−0.06409	−0.30064	+9.56416	+9.96867	15 43.8	+0.53192	−0.01392
10	+0.03251	0.29400	9.56418	9.96867	18 13.8	0.53193	0.01392
20	0.12912	0.28737	9.56420	9.96866	20 43.8	0.53194	0.01391
30	0.22572	0.28075	9.56422	9.96866	23 13.8	0.53194	0.01390
40	0.32233	0.27413	9.56424	9.96866	25 43.8	0.53195	0.01390
50	0.41893	0.26753	9.56426	9.96865	28 13.8	0.53195	0.01389
2 0	+0.51554	−0.26093	+9.56428	+9.96865	30 43.8	+0.53196	−0.01389
10	0.61214	0.25434	9.56430	9.96865	33 13.8	0.53196	0.01389
20	0.70874	0.24775	9.56432	9.96864	35 43.8	0.53196	0.01388
30	0.80533	0.24118	9.56434	9.96864	38 13.8	0.53197	0.01388
40	0.90193	0.23461	9.56437	9.96864	40 43.8	0.53197	0.01388
50	0.99852	0.22805	9.56439	9.96863	43 13.8	0.53197	0.01388
3 0	+1.09511	−0.22150	+9.56441	+9.96863	45 43.8	+0.53197	−0.01388
10	1.19170	0.21496	9.56443	9.96863	48 13.8	0.53197	0.01388
20	1.28828	0.20842	9.56445	9.96862	50 43.8	0.53197	0.01388
30	1.38486	0.20189	9.56447	9.96862	53 13.8	0.53197	0.01388
40	1.48144	0.19537	9.56449	9.96862	55 43.8	0.53196	0.01388
50	+1.57801	−0.18886	+9.56451	+9.96861	58 13.8	+0.53196	−0.01389

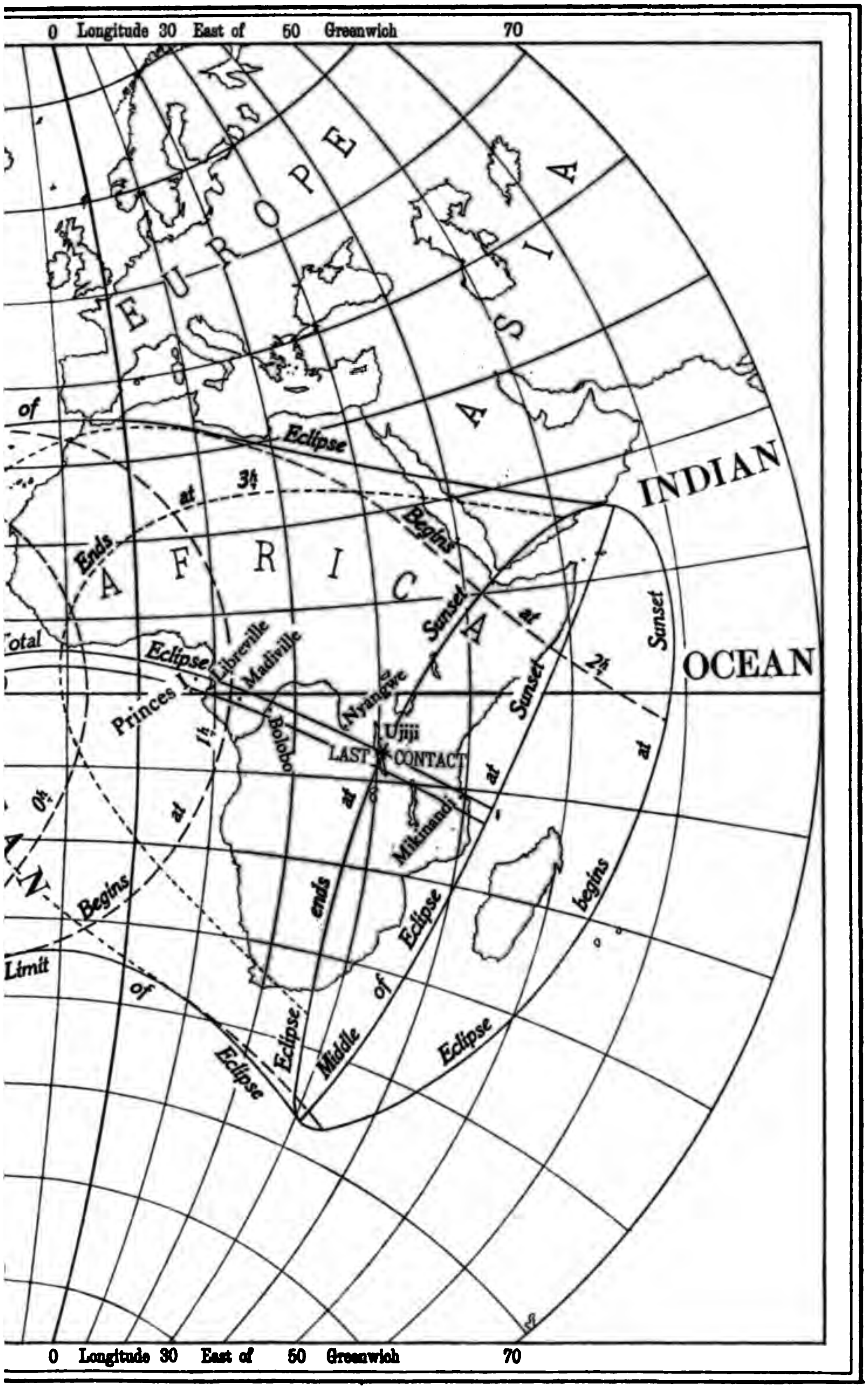
Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.	
				Penumbra.	Umbra.
h m					
22 0	+7.9848	+6.8311	+1.1761	+7.66389	+7.66172
23 0	7.9849	6.8283	1.1761	7.66388	7.66171
0 0	7.9850	6.8253	1.1761	7.66388	7.66171
1 0	7.9850	6.8223	1.1761	7.66388	7.66171
2 0	7.9850	6.8192	1.1761	7.66387	7.66171
3 0	7.9849	6.8161	1.1761	7.66387	7.66170
4 0	+7.9848	+6.8130	+1.1761	+7.66387	+7.66170

TOTAL ECLIPSE O



Note:- The hours of beginning and endi

MAY 28-29, 1919.



are expressed in Greenwich Mean Time.

THE NORRIS PETERS CO., WASHINGTON, D. C.

PATH OF TOTAL PHASE DURING THE ECLIPSE OF THE SUN, MAY 28–29, 1919.

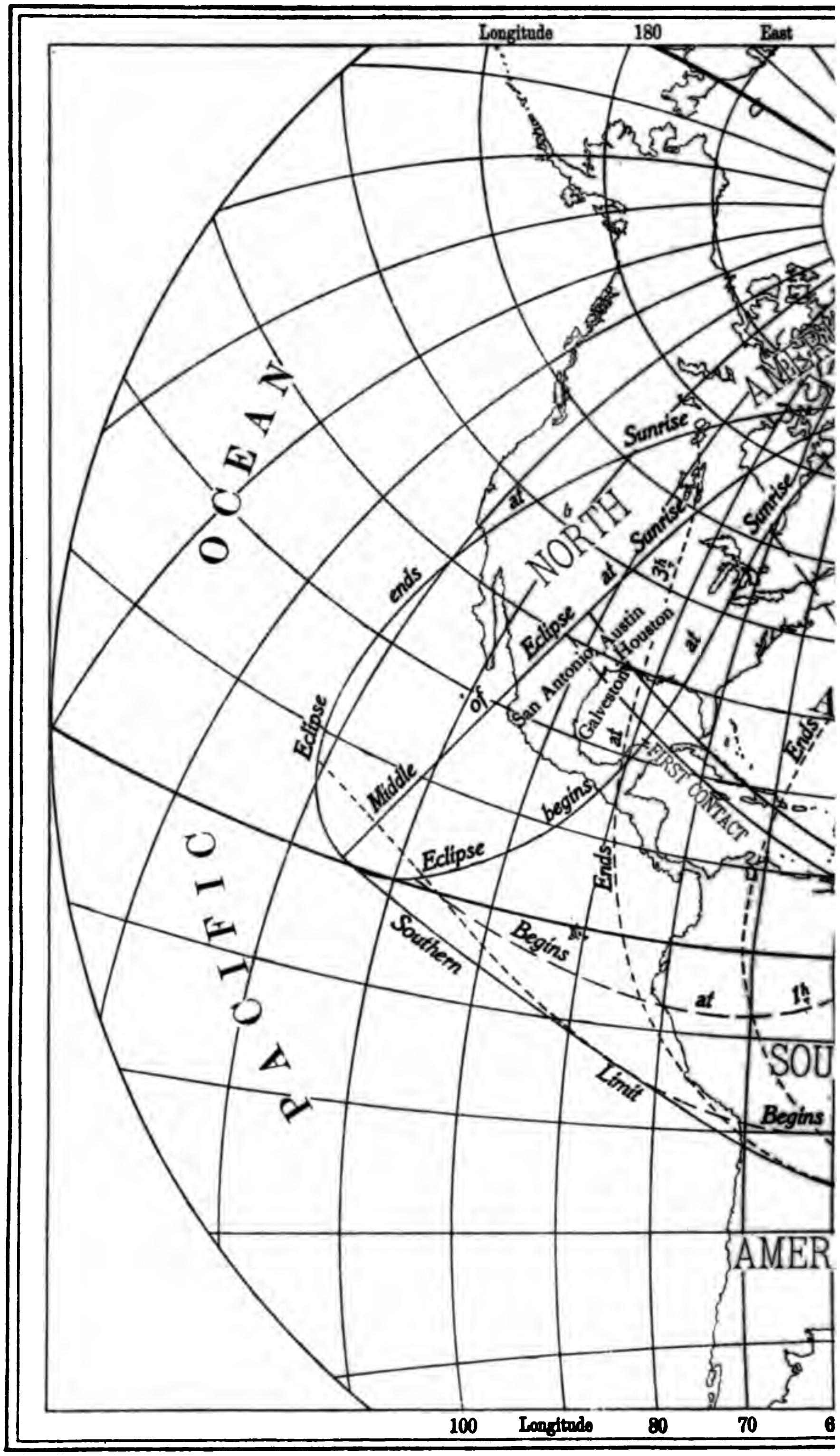
Greenwich Mean Time.	Northern Limit.		Central Line.		Southern Limit.		Duration of Total Phase on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits.	−18 57	+75 26	−19 43	+75 9	−20 29	+74 51	. . . .
23h 35m	12 3.9	59 51.9	13 0.4	59 45.4	13 58.4	59 42.6	3 46.3
40	9 18.3	54 11.2	10 14.1	53 58.7	11 11.0	53 48.5	4 9.1
45	7 14.3	50 2.6	8 10.4	49 47.4	9 7.5	49 34.6	4 27.9
50	5 32.6	46 40.0	6 29.4	46 23.5	7 27.0	46 9.1	4 44.4
55	4 5.7	43 46.1	5 3.2	43 28.9	6 1.4	43 13.5	4 59.5
0 0	− 2 49.7	+41 11.6	− 3 47.9	+40 54.2	− 4 46.8	+40 38.2	5 13.4
5	1 42.3	38 51.5	2 41.3	38 34.0	3 40.9	38 17.8	5 26.3
10	− 0 42.1	36 42.2	1 41.9	36 24.9	2 42.1	36 8.7	5 38.3
15	+ 0 12.0	34 41.2	0 48.5	34 24.3	1 49.4	34 8.3	5 49.4
20	1 0.9	32 46.9	− 0 0.3	32 30.4	1 1.9	32 14.8	5 59.6
25	1 45.0	30 57.8	+ 0 43.1	30 41.9	− 0 19.1	30 26.8	6 9.0
30	+ 2 24.7	+29 12.9	+ 1 22.2	+28 57.7	+ 0 19.3	+28 43.2	6 17.5
35	3 0.3	27 31.5	1 57.2	27 17.1	0 53.8	27 3.2	6 25.1
40	3 32.2	25 52.7	2 28.5	25 39.2	1 24.5	25 26.2	6 31.8
45	4 0.4	24 16.2	2 56.2	24 3.6	1 51.8	23 51.4	6 37.5
50	4 25.2	22 41.2	3 20.5	22 29.6	2 15.7	22 18.3	6 42.2
55	4 46.6	21 7.3	3 41.6	20 56.8	2 36.3	20 46.5	6 45.9
1 0	+ 5 4.7	+19 34.2	+ 3 59.4	+19 24.8	+ 2 53.8	+19 15.6	6 48.5
5	5 19.6	18 1.5	4 14.0	17 53.2	3 8.2	17 45.1	6 50.1
10	5 31.3	16 28.8	4 25.5	16 21.6	3 19.5	16 14.6	6 50.6
15	5 39.8	14 55.7	4 33.9	14 49.8	3 27.8	14 43.9	6 50.0
20	5 45.1	13 21.9	4 39.1	13 17.2	3 33.0	13 12.4	6 48.3
25	5 47.1	11 47.0	4 41.2	11 43.5	3 35.0	11 39.9	6 45.5
30	+ 5 45.8	+10 10.6	+ 4 39.9	+10 8.4	+ 3 33.9	+10 6.0	6 41.6
35	5 41.0	8 32.4	4 35.3	8 31.4	3 29.5	8 30.1	6 36.6
40	5 32.6	6 51.9	4 27.3	6 52.1	3 21.7	6 51.9	6 30.6
45	5 20.5	5 8.4	4 15.5	5 9.8	3 10.3	5 10.7	6 23.6
50	5 4.4	3 21.4	3 59.9	3 24.0	2 55.1	3 25.8	6 15.6
55	4 44.1	+ 1 30.2	3 40.1	+ 1 33.8	2 35.7	+ 1 36.6	6 6.6
2 0	+ 4 19.1	− 0 26.2	+ 3 15.7	− 0 21.6	+ 2 11.9	− 0 17.9	5 56.7
5	3 49.1	2 28.8	2 46.3	2 23.3	1 43.2	2 18.8	5 45.8
10	3 13.4	4 39.1	2 11.3	4 32.8	1 8.8	4 27.7	5 34.0
15	2 31.1	6 59.2	1 29.8	6 52.2	+ 0 28.1	6 46.6	5 21.2
20	1 41.0	9 31.8	+ 0 40.6	9 24.4	− 0 20.3	9 18.4	5 7.5
25	+ 0 41.4	12 21.0	− 0 18.1	12 13.5	1 18.2	12 7.5	4 52.6
30	− 0 30.6	−15 33.7	− 1 29.2	−15 26.3	− 2 28.5	−15 20.8	4 36.4
35	2 0.2	19 21.6	2 57.9	19 15.2	3 56.5	19 11.1	4 18.4
40	3 58.4	24 11.3	4 55.6	24 7.6	5 54.0	24 7.0	3 57.5
45	7 2.7	31 33.0	8 1.9	31 40.4	9 3.3	31 53.6	3 29.7
Limits.	−11 39	−42 42	−12 25	−42 27	−13 11	−42 11	. . . .

BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN NOVEMBER 22, 1919.

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Umbra on Fundamental Plane.	
	x	y	Log sin d	Log cos d	μ	l_1	l_2
h m					° ′		
0 10	−1.47916	+0.63321	−9.53356	+9.97305	5 59.7	+0.57396	+0.02790
20	1.39590	0.62330	9.53359	9.97305	8 29.7	0.57397	0.02791
30	1.31265	0.61339	9.53362	9.97304	10 59.7	0.57398	0.02792
40	1.22939	0.60348	9.53365	9.97304	13 29.7	0.57399	0.02793
50	1.14612	0.59358	9.53368	9.97304	15 59.7	0.57400	0.02794
1 0	−1.06285	+0.58368	−9.53371	+9.97303	18 29.7	+0.57401	+0.02795
10	0.97958	0.57379	9.53374	9.97303	20 59.7	0.57402	0.02796
20	0.89631	0.56391	9.53377	9.97302	23 29.6	0.57403	0.02797
30	0.81304	0.55403	9.53381	9.97302	25 59.6	0.57404	0.02798
40	0.72977	0.54416	9.53384	9.97301	28 29.6	0.57404	0.02799
50	0.64649	0.53430	9.53387	9.97301	30 59.6	0.57405	0.02799
2 0	−0.56321	+0.52444	−9.53390	+9.97301	33 29.6	+0.57406	+0.02800
10	0.47993	0.51458	9.53393	9.97300	35 59.6	0.57406	0.02800
20	0.39664	0.50473	9.53396	9.97300	38 29.6	0.57407	0.02801
30	0.31336	0.49489	9.53399	9.97299	40 59.5	0.57407	0.02801
40	0.23008	0.48506	9.53402	9.97299	43 29.5	0.57408	0.02802
50	0.14679	0.47523	9.53405	9.97299	45 59.5	0.57408	0.02802
3 0	−0.06351	+0.46541	−9.53409	+9.97298	48 29.5	+0.57408	+0.02802
10	+0.01978	0.45559	9.53412	9.97298	50 59.5	0.57408	0.02803
20	0.10307	0.44578	9.53415	9.97297	53 29.5	0.57409	0.02803
30	0.18636	0.43597	9.53418	9.97297	55 59.5	0.57409	0.02803
40	0.26965	0.42618	9.53421	9.97296	58 29.4	0.57409	0.02803
50	0.35294	0.41639	9.53424	9.97296	60 59.4	0.57409	0.02803
4 0	+0.43623	+0.40660	−9.53427	+9.97296	63 29.4	+0.57409	+0.02803
10	0.51952	0.39682	9.53430	9.97295	65 59.4	0.57409	0.02803
20	0.60281	0.38705	9.53434	9.97295	68 29.4	0.57409	0.02803
30	0.68610	0.37728	9.53437	9.97294	70 59.4	0.57408	0.02803
40	0.76939	0.36752	9.53440	9.97294	73 29.4	0.57408	0.02803
50	0.85268	0.35777	9.53443	9.97294	75 59.4	0.57408	0.02802
5 0	+0.93597	+0.34803	−9.53446	+9.97293	78 29.3	+0.57408	+0.02802
10	1.01926	0.33829	9.53449	9.97293	80 59.3	0.57407	0.02802
20	1.10254	0.32855	9.53452	9.97292	83 29.3	0.57407	0.02801
30	1.18583	0.31883	9.53455	9.97292	85 59.3	0.57406	0.02801
40	1.26911	0.30911	9.53458	9.97292	88 29.3	0.57406	0.02800
50	1.35239	0.29939	9.53461	9.97291	90 59.3	0.57405	0.02799
6 0	+1.43567	+0.28968	−9.53465	+9.97291	93 29.3	+0.57404	+0.02799
10	1.51895	0.27998	9.53468	9.97291	95 59.2	0.57404	0.02798
20	+1.60222	+0.27028	−9.53471	+9.97290	98 29.2	+0.57403	+0.02797

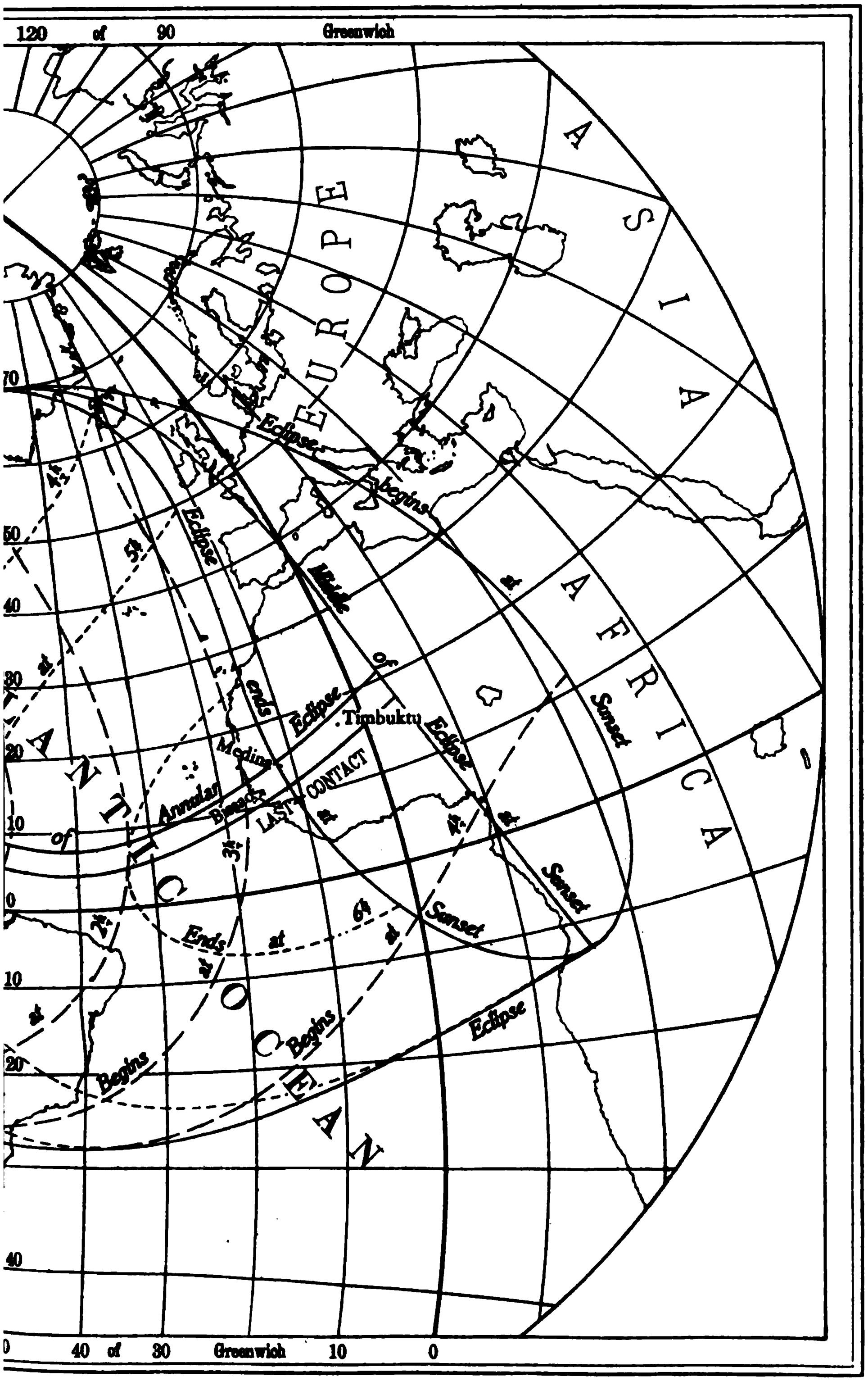
Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.	
				Penumbra.	Umbra.
h m					
0 0	+7.9204	−6.9968	+1.1761	+7.67540	+7.67323
1 0	7.9205	6.9953	1.1761	7.67540	7.67324
2 0	7.9205	6.9937	1.1761	7.67541	7.67324
3 0	7.9206	6.9921	1.1761	7.67541	7.67324
4 0	7.9206	6.9904	1.1761	7.67541	7.67325
5 0	7.9206	6.9887	1.1761	7.67542	7.67325
6 0	7.9205	6.9870	1.1761	7.67542	7.67325
7 0	+7.9204	−6.9854	+1.1761	+7.67543	+7.67326

ANNULAR ECLIPS



Note:- The hours of beginning a

NOVEMBER 22, 1919.



are expressed in Greenwich Mean Time.

THE NORRIS PETERS CO., WASHINGTON D. C.

PATH OF ANNULAR PHASE DURING THE ECLIPSE OF THE SUN, NOVEMBER 22, 1919.

Greenwich Mean Time.	Northern Limit.		Central Line.		Southern Limit.		Duration of Annular Phase on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits.	+33 19	+101 57	+31 41	+102 31	+30 3	+103 4	. . . .
1^{h} 30^{m}	30 30.9	94 57.4	27 37.5	92 29.0	25 16.1	91 12.1	7 36.6
35	26 11.8	85 24.5	24 9.3	84 54.6	22 15.1	84 38.3	8 4.4
40	23 42.9	80 24.5	21 52.5	80 18.5	20 7.3	80 19.6	8 25.2
45	21 48.4	76 44.7	20 4.3	76 49.6	18 24.5	76 59.3	8 43.2
50	20 13.1	73 47.1	18 33.1	73 58.2	16 56.7	74 12.9	8 59.9
55	18 50.7	71 16.1	17 13.6	71 31.2	15 39.6	71 49.1	9 15.5
2 0	+17 37.8	+ 69 3.7	+16 2.8	+ 69 21.6	+14 30.6	+ 69 41.6	9 30.2
5	16 32.5	67 5.1	14 59.1	67 24.9	13 28.2	67 46.3	9 44.2
10	15 33.5	65 17.1	14 1.3	65 38.1	12 31.3	66 0.5	9 57.4
15	14 39.8	63 37.5	13 8.4	63 59.2	11 39.1	64 22.3	10 10.0
20	13 50.7	62 4.4	12 20.0	62 26.7	10 51.2	62 50.1	10 21.9
25	13 5.7	60 36.7	11 35.4	60 59.3	10 7.0	61 22.8	10 33.2
30	+12 24.4	+ 59 13.4	+10 54.4	+ 59 36.0	+ 9 26.1	+ 59 59.5	10 43.7
35	11 46.4	57 53.7	10 16.6	58 16.3	8 48.4	58 39.5	10 53.4
40	11 11.6	56 37.0	9 41.8	56 59.3	8 13.6	57 22.3	11 2.3
45	10 39.8	55 22.7	9 9.9	55 44.7	7 41.6	56 7.3	11 10.3
50	10 10.8	54 10.2	8 40.7	54 31.9	7 12.3	54 53.9	11 17.4
55	9 44.4	52 59.3	8 14.1	53 20.4	6 45.5	53 41.9	11 23.5
3 0	+ 9 20.6	+ 51 49.4	+ 7 50.0	+ 52 10.0	+ 6 21.2	+ 52 30.9	11 28.5
5	8 59.2	50 40.3	7 28.4	51 0.3	5 59.2	51 20.5	11 32.4
10	8 40.3	49 31.7	7 9.2	49 51.0	5 39.6	50 10.4	11 35.1
15	8 23.9	48 23.1	6 52.3	48 41.7	5 22.4	49 0.3	11 36.6
20	8 9.8	47 14.3	6 37.9	47 32.1	5 7.6	47 50.0	11 36.9
25	7 58.1	46 5.0	6 25.8	46 22.1	4 55.1	46 39.1	11 35.9
30	+ 7 48.9	+ 44 54.8	+ 6 16.1	+ 45 11.1	+ 4 45.0	+ 45 27.3	11 33.7
35	7 42.1	43 43.4	6 8.9	43 59.0	4 37.3	44 14.3	11 30.2
40	7 37.8	42 30.5	6 4.1	42 45.4	4 32.1	42 59.9	11 25.4
45	7 36.1	41 15.8	6 2.0	41 30.0	4 29.5	41 43.6	11 19.4
50	7 37.2	39 58.7	6 2.6	40 12.2	4 29.6	40 25.0	11 12.3
55	7 41.1	38 38.7	6 6.0	38 51.6	4 32.5	39 3.7	11 4.0
4 0	+ 7 48.1	+ 37 15.4	+ 6 12.4	+ 37 27.8	+ 4 38.3	+ 37 39.2	10 54.5
5	7 58.3	35 48.0	6 22.0	36 0.1	4 47.3	36 10.9	10 44.0
10	8 12.2	34 15.8	6 35.1	34 27.6	4 59.8	34 38.0	10 32.5
15	8 30.0	32 37.7	6 52.1	32 49.5	5 16.0	32 59.7	10 20.1
20	8 52.4	30 52.3	7 13.4	31 4.5	5 36.5	31 14.7	10 6.7
25	9 19.9	28 57.9	7 39.7	29 10.8	6 1.8	29 21.4	9 52.4
30	+ 9 53.5	+ 26 52.5	+ 8 11.8	+ 27 6.6	+ 6 32.5	+ 27 18.0	9 37.1
35	10 34.6	24 32.3	8 51.0	24 48.6	7 10.0	25 1.5	9 20.9
40	11 25.3	21 51.7	9 39.1	22 11.7	7 56.0	22 27.4	9 3.5
45	12 29.4	18 41.7	10 39.4	19 7.9	8 53.2	19 28.3	8 44.8
50	13 54.4	14 43.0	11 58.0	15 21.4	10 6.7	15 50.8	8 24.0
55	16 1.5	+ 9 0.4	13 50.4	+ 10 11.0	11 48.8	+ 11 2.2	7 59.5
Limits.	+20 52	− 3 48	+19 11	− 4 11	+17 32	− 4 36	. . . .

LOCAL CIRCUMSTANCES OF THE ECLIPSE OF THE SUN, NOV. 22, 1919.

Place.	Beginning.			Middle.		Ending.		
	Greenwich Mean Time.	Angle from North Point.	Angle from Vertex.	Greenwich Mean Time.	Magnitude.	Greenwich Mean Time.	Angle from North Point.	Angle from Vertex.
	h m	°	°	h m		h m	°	°
Albany, N. Y.	0 46	253	293	2 0	0.43	3 24	138	154
Allegheny, Pa.	0 35	260	305	1 50	0.53	3 16	133	155
Amherst, Mass.	0 47	253	292	2 2	0.43	3 26	139	153
Ann Arbor, Mich.	...	...	...	1 48	0.54	3 10	132	158
Appleton, Wis.	...	...	...	1 46	0.54	3 5	132	160
Atlanta, Ga.	0 22	273	327	1 40	0.72	3 11	122	153
Augusta, Me.	0 56	248	283	2 8	0.37	3 29	142	154
Austin, Tex.	...	...	...	1 29 [1]	0.94 [1]	2 52	108	154
Baton Rouge, La.	...	...	...	1 32	0.87	3 1	113	153
Bismarck, N. Dak.	...	...	...	...	[0.52][2]	2 56	128	162
Buffalo, N. Y.	0 41	256	298	1 54	0.48	3 16	136	157
Cambridge, Mass.	0 49	252	290	2 4	0.41	3 28	140	152
Charleston, W. Va.	0 30	264	312	1 46	0.59	3 14	129	155
Charlottesville, Va.	0 32	263	310	1 49	0.57	3 20	131	153
Cheyenne, Wyo.	...	...	...	...	[0.58][2]	2 51	119	159
Cincinnati, Ohio	...	...	...	1 44	0.60	3 10	128	156
Cleveland, Ohio	0 36	260	304	1 49	0.53	3 13	133	157
Columbia, Mo.	...	...	...	1 38	0.68	3 0	123	158
Columbia, S. C.	0 24	271	323	1 43	0.68	3 17	124	151
Columbus, Ohio	0 32	263	310	1 46	0.57	3 12	130	156
Denver, Colo.	...	...	...	...	[0.62][2]	2 50	117	159
Des Moines, Iowa	...	...	...	1 40	0.64	3 0	126	159
Dover, Del.	0 37	260	304	1 54	0.52	3 24	134	152
Evanston, Ill.	...	...	...	1 44	0.57	3 6	130	159
Flagstaff, Ariz.	...	...	...	...	[0.38][2]	2 43	107	156
Geneva, N. Y.	0 43	255	296	1 56	0.46	3 19	137	156
Greencastle, Ind.	...	...	...	1 42	0.62	3 7	128	157
Hanover, N. H.	0 50	251	288	2 3	0.40	3 25	140	154
Harrisburg, Pa.	0 38	259	302	1 53	0.51	3 21	134	154
Helena, Mont.	...	...	...	...	[0.07][2]	2 51	122	161
Iowa City, Iowa	...	...	...	1 41	0.62	3 2	127	159
Ithaca, N. Y.	0 42	255	296	1 56	0.46	3 20	137	155
Jackson, Miss.	...	...	...	1 34	0.82	3 2	116	154
Kansas City, Mo.	...	...	...	1 37	0.70	2 58	122	158
Little Rock, Ark.	...	...	...	1 34	0.78	3 0	118	156
Louisville, Ky.	...	...	...	1 42	0.64	3 8	126	156
Madison, Wis.	...	...	...	1 44	0.57	3 4	130	160
Minneapolis, Minn.	...	...	...	1 44	0.56	3 1	130	161
Montgomery, Ala.	...	...	...	1 37	0.77	3 9	119	153
Mount Wilson, Cal.	...	...	...	...	[0.05][2]	2 39	102	154
Nashville, Tenn.	...	...	...	1 39	0.69	3 7	123	155
New Haven, Conn.	0 44	254	295	2 0	0.45	3 26	138	152
New Orleans, La.	...	...	...	1 33	0.87	3 2	113	153
New York, N. Y.	0 42	256	298	1 58	0.47	3 25	136	153
Oklahoma City, Okla.	...	...	...	1 32	0.81	2 54	116	157
Omaha, Nebr.	...	...	...	1 38	0.66	2 58	124	159
Orono, Me.	0 59	246	280	2 10	0.35	3 30	144	153

[1] Duration of annular phase $7^m.1$.

[2] Magnitude at sunrise. Mid-eclipse below horizon.

LOCAL CIRCUMSTANCES OF THE ECLIPSE OF THE SUN, NOV. 22, 1919.

Place.	Beginning.			Middle.		Ending.		
	Greenwich Mean Time.	Angle from North Point.	Angle from Vertex.	Greenwich Mean Time.	Magnitude.	Greenwich Mean Time.	Angle from North Point.	Angle from Vertex.
	h m	°	°	h m		h m	°	°
Oxford, Miss.	...	...	...	1 36	0.76	3 4	119	155
Panama, Panama	0 23	309	24	1 45	0.64	3 28	92	133
Philadelphia, Pa.	0 39	258	301	1 55	0.50	3 24	135	153
Phoenix, Ariz.	...	...	...	...	[0.39][1]	2 42	104	155
Pierre, S. Dak.	...	...	...	...	[0.60][1]	2 55	125	161
Poughkeepsie, N. Y.	0 44	255	295	2 0	0.45	3 24	137	153
Raleigh, N. C.	0 28	266	316	1 48	0.62	3 21	128	151
Richmond, Va.	0 32	263	310	1 50	0.57	3 22	131	152
Salt Lake City, Utah	...	...	...	...	[0.25][1]	2 47	114	158
San Juan, P. R.	0 27	284	343	2 7	0.86	4 11	113	113
Santa Fe, N. Mex.	...	...	...	...	[0.68][1]	2 47	111	157
Springfield, Ill.	...	...	...	1 40	0.64	3 4	126	158
St. Louis, Mo.	...	...	...	1 39	0.67	3 3	124	157
Syracuse, N. Y.	0 44	254	294	1 57	0.45	3 20	138	156
Tallahassee, Fla.	0 19	278	335	1 38	0.80	3 12	118	151
Topeka, Kans.	...	...	...	1 36	0.71	2 57	121	158
Tuscaloosa, Ala.	...	...	...	1 37	0.77	3 6	119	154
Urbana, Ill.	...	...	...	1 42	0.62	3 5	127	158
Washington, D. C.	0 35	261	306	1 52	0.54	3 21	132	153
Williams Bay, Wis.	...	...	...	1 44	0.57	3 5	130	159

[1] Magnitude at sunrise. Mid-eclipse below horizon.

MEAN PLACES FOR 1919.0. (January 0^d.915, Greenwich.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motio
		h m s	s	° ′ ″	″
36 Piscium	6.2	0 12 24.221	−0.0027	+ 7 47 26.30	−0.006
d Piscium	5.4	0 16 25.733	+0.0003	7 44 25.89	+0.016
51 Piscium	5.6	0 28 12.943	+0.0021	6 30 29.98	+0.009
136 B. Piscium	6.5	0 37 0.647	−0.0084	8 54 47.64	−0.082
δ Piscium	4.6	0 44 28.692	+0.0055	7 8 40.23	−0.044
101 Piscium	6.2	1 31 26.435	+0.0010	+14 14 52.09	−0.002
π Piscium	5.6	1 32 48.104	−0.0049	11 43 39.27	+0.034
12 H^1. Arietis	6.3	1 58 13.305	−0.0009	13 5 11.79	−0.006
20 H^1. Arietis	6.4	2 4 55.933	+0.0112	16 50 41.93	−0.179
19 Arietis	5.8	2 8 38.034	+0.0071	14 54 2.97	−0.021
27 Arietis	6.4	2 26 24.648	+0.0029	+17 20 46.41	−0.089
36 Arietis	6.5	2 39 47.736	+0.0036	17 25 18.06	−0.040
40 Arietis	6.0	2 43 59.403	+0.0030	17 56 49.90	−0.019
π Arietis	5.2	2 44 46.152	+0.0004	17 7 41.35	−0.011
124 B. Arietis	6.4	2 48 40.645	+0.0012	16 9 12.77	−0.053
45 Arietis	6.0	2 51 15.165	−0.0011	+18 0 15.51	−0.006
ρ Arietis	5.6	2 51 51.609	+0.0196	17 42 3.36	−0.208
53 Arietis	6.0	3 2 51.842	−0.0019	17 34 5.15	+0.004
54 Arietis	6.5	3 3 45.379	+0.0018	18 29 6.01	−0.014
δ Arietis	4.5	3 6 59.641	+0.0110	19 25 16.67	+0.001
ζ Arietis	5.0	3 10 14.519	−0.0019	+20 44 42.16	−0.082
τ Arietis	5.2	3 16 32.848	+0.0023	20 51 21.16	−0.033
63 Arietis	5.2	3 18 5.328	−0.0032	20 27 11.96	−0.009
65 Arietis	6.0	3 19 45.694	+0.0006	20 31 1.01	−0.008
175 B. Arietis	6.4	3 22 25.590	+0.0026	18 28 24.98	−0.011
14 H^1. Tauri	6.5	3 34 17.838	. . . .	+20 39 10.05	. . .
13 Tauri	5.6	3 37 38.476	+0.0003	19 26 30.09	−0.019
14 Tauri	6.2	3 39 6.018	+0.0084	19 24 35.71	−0.049
22 H^1. Tauri	6.1	3 39 45.172	+0.0008	20 40 25.95	−0.006
133 B. Tauri	5.9	3 45 9.246	+0.0026	21 59 55.21	−0.042
32 Tauri	5.8	3 52 4.678	+0.0045	+22 14 44.36	−0.112
A Tauri	4.5	3 59 54.226	+0.0069	21 51 41.91	−0.058
39 Tauri	6.1	4 0 32.363	+0.0125	21 47 28.78	−0.131
43 Tauri	5.5	4 4 26.683	+0.0079	19 23 45.30	−0.044
192 B. Tauri	6.1	4 8 2.814	−0.0016	22 12 22.23	−0.019
ω Tauri	4.8	4 12 30.744	−0.0022	+20 22 49.24	−0.055
51 Tauri	5.6	4 13 35.429	+0.0071	21 22 56.28	−0.041
53 Tauri	5.3	4 14 39.529	+0.0028	20 56 50.53	−0.051
56 Tauri	5.2	4 14 48.858	+0.0032	21 34 43.90	−0.040
224 B. Tauri	6.1	4 17 36.698	−0.0002	20 37 51.45	−0.001
227 B. Tauri	5.9	4 18 45.856	+0.0019	+20 47 39.37	−0.031
κ Tauri	4.1	4 20 32.302	+0.0062	22 6 34.67	−0.042
67 Tauri	5.4	4 20 35.432	+0.0093	22 0 56.91	−0.047
υ Tauri	4.2	4 21 27.486	+0.0079	22 37 51.34	−0.047
72 Tauri	5.4	4 22 26.667	+0.0004	22 48 53.68	−0.008
247 B. Tauri	5.8	4 23 12.168	+0.0073	+21 26 23.75	−0.076
282 B. Tauri	6.4	4 30 57.495	−0.0028	19 42 56.86	+0.018
284 B. Tauri	6.0	4 31 36.410	+0.0109	23 10 34.22	−0.102
129 H^1. Tauri	5.8	4 33 29.091	+0.0013	20 31 22.76	−0.010
τ Tauri	4.3	4 37 22.890	+0.0007	22 48 9.45	−0.020
300 B. Tauri	6.2	4 40 48.926	+0.0005	+23 28 50.03	+0.004
ι Tauri	4.7	4 58 15.176	+0.0056	21 28 31.02	−0.049
330 B. Tauri	6.3	4 59 31.973	+0.0028	21 9 54.93	−0.034
333 B. Tauri	6.3	5 0 45.432	−0.0036	19 41 46.61	−0.018
l Tauri	5.2	5 3 0.712	−0.0033	20 18 44.60	−0.054
105 Tauri	6.0	5 3 4.739	+0.0004	+21 35 55.26	−0.007
107 Tauri	6.5	5 4 3.496	+0.0002	19 45 20.99	−0.015
108 Tauri	6.2	5 10 35.462	−0.0005	+22 11 35.54	−0.025

MEAN PLACES FOR 1919.0. (January 0d.915, Greenwich.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
n Tauri	5.1	5 14 24.564	+0.0021	+22 0 49.93	−0.083
351 B. Tauri	6.2	5 14 27.140	−0.0014	20 3 2.94	−0.029
353 B. Tauri	6.5	5 16 9.535	+0.0025	19 44 0.46	−0.024
o Tauri	4.8	5 22 46.133	+0.0006	21 52 8.07	−0.010
372 B. Tauri	6.1	5 28 49.893	−0.0001	20 25 4.22	−0.013
ζ Tauri	3.0	5 32 48.190	+0.0006	+21 5 39.09	−0.032
175 H^1. Tauri	6.5	5 37 10.043	−0.0020	22 37 16.65	+0.018
394 B. Tauri	6.0	5 38 24.376	+0.0011	23 10 0.60	−0.042
B. D.+19°1110	6.0	5 47 35.437	−0.0008	19 50 52.54	−0.031
χ^1 Orionis	4.5	5 49 35.160	−0.0126	20 15 44.28	−0.085
57 Orionis	5.8	5 50 8.948	+0.0008	+19 44 5.63	−0.013
141 Tauri	6.3	5 56 48.112	−0.0009	22 24 0.42	−0.011
64 Orionis	5.1	5 58 39.698	+0.0014	19 41 34.80	−0.021
χ^2 Orionis	4.7	5 59 6.581	+0.0011	20 8 29.42	−0.003
14 B. Geminorum	6.0	6 4 39.532	+0.0021	22 12 14.32	−0.040
68 Orionis	5.7	6 7 13.528	+0.0012	+19 48 35.00	−0.013
6 Geminorum	6.3	6 7 24.521	+0.0007	22 55 40.54	−0.013
η Geminorum (*var.*)	3.2	6 9 59.344	−0.0039	22 31 53.15	−0.016
71 Orionis	5.1	6 10 4.944	−0.0062	19 11 6.08	−0.194
μ Geminorum	3.2	6 18 3.648	+0.0046	22 33 22.93	−0.114
15 Geminorum	6.5	6 22 56.982	−0.0015	+20 50 24.60	−0.054
16 Geminorum	6.2	6 23 7.668	−0.0019	20 32 45.37	−0.005
ν Geminorum	4.1	6 24 9.231	−0.0005	20 15 52.52	−0.016
74 B. Geminorum	6.2	6 42 39.502	+0.0002	18 16 56.12	−0.056
110 B. Geminorum	6.2	6 57 42.868	. . . .	17 52 17.30	. . .
ζ Geminorum (*var.*)	3.7	6 59 18.369	−0.0002	+20 41 24.79	−0.007
162 B. Geminorum	5.7	7 27 8.235	+0.0018	17 15 35.18	−0.064
f Geminorum	5.3	7 34 48.004	−0.0002	17 51 36.55	+0.004
g Geminorum	5.0	7 41 26.200	−0.0048	18 42 31.29	−0.063
1 Cancri	6.0	7 52 23.613	−0.0021	16 0 27.46	−0.044
2 B. Cancri	6.0	7 53 54.340	+0.0003	+16 44 16.72	+0.004
3 Cancri	5.7	7 56 8.960	−0.0001	17 31 53.64	−0.010
5 Cancri	5.9	7 56 53.413	+0.0004	16 40 46.86	0.000
30 B. Cancri	6.1	8 6 25.969	−0.0007	14 52 11.61	−0.013
29 Cancri	5.9	8 24 6.227	−0.0017	14 28 47.07	−0.022
84 B. Cancri	6.4	8 29 15.944	−0.0023	+13 32 5.11	−0.095
90 B. Cancri	6.3	8 31 35.306	+0.0006	15 35 40.40	−0.027
A^1 Cancri	5.5	8 38 44.665	−0.0002	12 58 20.01	−0.002
A^2 Cancri	5.7	8 42 29.719	−0.0049	12 24 28.73	−0.057
60 Cancri	5.7	8 51 30.324	−0.0009	11 56 10.36	−0.019
α Cancri	4.3	8 54 3.562	+0.0024	+12 10 19.25	−0.042
κ Cancri	5.1	9 3 21.729	−0.0012	10 59 41.70	−0.013
209 B. Cancri	6.5	9 5 22.485	−0.0007	11 53 41.95	−0.079
222 B. Cancri	6.3	9 13 28.238	+0.0046	11 50 27.75	−0.007
ω Leonis	5.5	9 24 7.311	+0.0038	9 24 36.52	−0.012
3 Leonis	5.8	9 24 10.482	−0.0023	+ 8 32 33.15	−0.025
h Leonis	5.2	9 27 37.225	+0.0001	10 4 25.21	−0.013
o Leonis	3.8	9 36 49.779	−0.0096	10 15 41.67	−0.033
10 B. Sextantis	6.0	9 41 53.808	+0.0009	7 4 58.70	−0.034
25 B. Sextantis	6.3	9 49 27.892	+0.0013	6 20 26.33	. . .
89 B. Leonis	6.2	9 53 50.287	+0.0010	+ 8 42 4.23	−0.029
π Leonis	4.9	9 55 56.064	−0.0029	8 26 0.29	−0.027
14 Sextantis	6.3	10 2 33.378	−0.0022	6 0 26.04	−0.002
19 Sextantis	5.9	10 8 35.519	−0.0037	5 0 55.81	−0.006
155 B. Leonis	6.5	10 19 2.243	−0.0167	6 6 20.02	−0.071
237 B. Leonis	6.3	10 48 4.062	+0.0002	+ 1 27 16.78	−0.055
55 Leonis	6.1	10 51 32.431	+0.0073	1 10 8.35	−0.013
p^3 Leonis	6.1	10 59 27.860	−0.0045	+ 0 26 8.37	+0.006

MEAN PLACES FOR 1919.0. (January $0^d.915$, Greenwich.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
p^5 Leonis	5.3	11 9 36.808	−0.0029	+ 0 22 17.06	−0.003
388 B. Leonis	6.3	11 23 45.384	−0.0025	− 1 15 14.00	+0.007
ε Leonis	5.1	11 26 10.587	+0.0018	2 33 22.52	−0.008
431 B. Leonis	6.2	11 34 15.710	−0.0028	1 59 16.77	+0.047
13 B. Virginis	5.9	11 46 53.792	+0.0008	4 52 57.76	+0.006
78 B. Virginis	6.5	12 10 6.466	−0.0051	− 5 16 7.45	+0.114
q Virginis	5.3	12 29 35.822	−0.0057	9 0 18.94	+0.004
χ Virginis	4.8	12 35 3.824	−0.0056	7 33 0.02	−0.031
370 B. Virginis	6.0	12 50 5.683	−0.0058	11 12 34.88	−0.037
ψ Virginis	5.0	12 50 8.303	−0.0024	9 5 57.62	−0.028
49 Virginis	5.2	13 3 39.058	+0.0007	−10 18 27.46	−0.014
50 Virginis	6.2	13 5 30.837	+0.0003	9 53 51.29	−0.017
α Virginis (*Spica*)	1.2	13 20 55.405	−0.0028	10 44 19.88	−0.032
i Virginis	5.7	13 22 26.238	−0.0096	12 17 11.24	−0.023
550 B. Virginis	6.0	13 30 21.907	−0.0040	12 47 57.51	−0.014
85 Virginis	6.1	13 41 13.223	−0.0029	−15 21 39.51	−0.034
86 Virginis	5.6	13 41 37.184	−0.0014	12 1 15.19	+0.012
621 B. Virginis	6.4	14 0 3.686	−0.0030	14 34 58.03	−0.018
214 G. Virginis	6.5	14 0 48.840	−0.0036	15 56 54.99	−0.012
40 H. Virginis	5.1	14 6 24.874	+0.0003	15 55 11.76	−0.014
ι Libræ	4.7	15 7 36.022	−0.0031	−19 29 10.09	−0.053
25 Libræ	6.0	15 8 42.139	−0.0036	19 20 35.51	−0.035
26 Libræ	6.3	15 9 59.282	−0.0022	17 28 0.15	−0.016
28 Libræ	6.2	15 16 17.891	−0.0015	17 51 54.52	−0.061
147 B. Libræ	6.2	15 25 55.221	+0.0020	20 27 2.11	−0.029
150 B. Libræ	6.1	15 27 3.532	−0.0066	−19 53 18.74	−0.031
11 H. Libræ	5.4	15 27 57.374	−0.0012	19 23 43.13	−0.036
172 B. Libræ	5.9	15 33 33.363	. . . .	20 44 55.75	. . .
41 Libræ	5.3	15 34 14.644	+0.0069	19 2 8.59	−0.058
κ Libræ	5.0	15 37 16.556	−0.0035	19 25 1.06	−0.106
λ Libræ	5.1	15 48 37.706	−0.0017	−19 55 33.86	−0.046
47 Libræ	5.8	15 50 19.346	−0.0010	19 8 40.65	−0.020
10 G. Scorpii	5.9	15 52 56.353	+0.0012	20 44 56.56	−0.020
δ Scorpii	2.5	15 55 32.417	−0.0011	22 23 31.98	−0.035
β Scorpii	2.9	16 0 43.408	−0.0011	19 35 5.00	−0.028
56 B. Scorpii	5.0	16 0 43.877	−0.0010	−19 34 51.22	−0.005
ω^1 Scorpii	4.3	16 2 3.919	−0.0015	20 27 3.32	−0.039
ω^2 Scorpii	4.6	16 2 39.142	+0.0030	20 39 3.83	−0.061
ν Scorpii	3.9	16 7 17.035	−0.0017	19 15 4.92	−0.041
84 B. Scorpii	6.3	16 9 42.965	−0.0013	20 54 9.64	−0.043
51 G. Scorpii	6.5	16 12 12.230	−0.0011	−21 6 11.98	−0.029
58 G. Scorpii	6.2	16 14 22.942	+0.0002	20 1 16.31	−0.008
ψ Ophiuchi	4.6	16 19 21.671	−0.0014	19 50 55.95	−0.060
ω Ophiuchi	4.5	16 27 19.951	+0.0014	21 17 38.77	+0.026
123 B. Scorpii	6.5	16 35 47.878	+0.0008	20 15 5.35	+0.037
131 B. Scorpii	5.5	16 37 7.878	+0.0021	−19 46 12.22	+0.045
68 B. Ophiuchi	5.9	16 48 38.166	−0.0032	20 16 51.95	−0.040
24 Ophiuchi	5.5	16 51 54.825	+0.0001	23 1 22.74	−0.034
109 B. Ophiuchi	6.2	16 59 57.333	+0.0002	20 22 53.87	−0.013
116 B. Ophiuchi	6.3	17 1 21.473	−0.0022	21 27 12.25	−0.083
ξ Ophiuchi	4.4	17 16 8.901	+0.0172	−21 1 36.50	−0.197
190 B. Ophiuchi	5.9	17 19 51.317	−0.0008	21 22 2.11	−0.045
52 Ophiuchi	6.4	17 30 26.055	−0.0007	21 59 24.31	−0.004
58 Ophiuchi	4.8	17 38 34.552	−0.0062	21 38 41.78	−0.052
16 G. Sagittarii	6.4	17 55 11.025	+0.0016	20 20 3.81	−0.025
21 G. Sagittarii	5.7	17 56 59.887	−0.0013	−22 46 46.13	−0.044
30 G. Sagittarii	6.2	18 2 19.894	+0.0006	21 27 11.42	−0.003
39 G. Sagittarii	6.3	18 6 26.648	−0.0027	−19 51 31.94	−0.040

MEAN PLACES FOR 1919.0. (January $0^d.915$, Greenwich.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
μ Sagittarii	4.0	18 8 55.117	−0.0004	−21 4 52.30	−0.002
14 Sagittarii	5.6	18 9 23.907	−0.0012	21 44 8.89	−0.028
15 Sagittarii	5.3	18 10 22.970	+0.0003	20 45 11.84	+0.006
16 Sagittarii	5.9	18 10 23.814	+0.0005	20 24 47.41	−0.002
Y Sagittarii (*var.*)	5.4	18 16 37.071	. . . .	18 53 49.36	−0.001
21 Sagittarii	5.0	18 20 31.571	0.0000	−20 35 9.80	−0.024
95 B. Sagittarii	5.7	18 25 26.284	+0.0041	18 46 51.53	−0.072
115 B. Sagittarii	5.7	18 33 3.377	−0.0021	21 27 57.95	−0.100
121 B. Sagittarii	5.9	18 34 3.655	−0.0056	21 7 11.20	−0.138
128 B. Sagittarii	6.3	18 40 28.580	+0.0019	21 5 5.78	−0.039
29 Sagittarii	5.3	18 44 51.783	+0.0005	−20 25 4.38	+0.030
33 Sagittarii	5.8	18 49 9.637	−0.0008	21 27 35.96	−0.015
36 Sagittarii	5.1	18 52 31.659	−0.0010	20 45 48.06	−0.011
ξ Sagittarii	3.7	18 52 53.882	+0.0023	21 12 51.35	−0.028
171 B. Sagittarii	6.1	18 58 18.176	0.0000	19 21 50.36	−0.035
173 B. Sagittarii	6.4	18 58 21.691	+0.0020	−19 13 14.96	. . .
187 B. Sagittarii	6.4	19 2 24.069	+0.0036	18 51 50.68	−0.056
190 B. Sagittarii	5.4	19 3 31.210	+0.0001	19 25 5.51	−0.008
195 B. Sagittarii	6.3	19 5 1.596	+0.0019	19 55 55.75	−0.050
d Sagittarii	5.0	19 12 53.780	−0.0015	19 5 53.38	−0.017
226 B. Sagittarii	6.4	19 16 52.400	+0.0002	−19 23 12.32	+0.009
ρ Sagittarii	4.0	19 16 58.558	−0.0020	18 0 2.87	+0.015
45 Sagittarii	6.0	19 17 7.450	+0.0064	18 27 33.67	−0.082
266 B. Sagittarii	6.1	19 31 42.798	+0.0003	19 1 57.80	−0.009
267 B. Sagittarii	5.8	19 32 21.463	+0.0011	18 24 42.94	−0.002
54 Sagittarii	5.4	19 36 5.044	+0.0046	−16 28 48.10	−0.047
e Sagittarii	5.2	19 37 53.216	+0.0040	16 18 53.51	−0.015
g Sagittarii	5.1	19 53 21.478	+0.0004	15 42 25.67	−0.081
16 B. Capricorni	6.2	20 16 13.612	+0.0025	15 2 27.90	+0.004
β Capricorni	3.2	20 16 27.746	+0.0030	15 2 17.00	+0.007
31 B. Capricorni	6.4	20 24 9.832	+0.0013	−16 0 37.02	+0.019
27 G. Capricorni	6.2	20 26 32.022	−0.0058	15 19 41.61	−0.092
45 B. Capricorni	6.1	20 29 41.204	+0.0035	14 0 2.02	+0.060
τ Capricorni	5.2	20 34 44.718	+0.0006	15 14 22.82	−0.015
84 B. Capricorni	6.0	20 46 14.079	+0.0106	12 50 42.92	−0.034
16 B. Aquarii	6.4	20 48 39.827	+0.0021	−11 52 49.16	+0.065
ν Aquarii	4.5	21 5 10.986	+0.0057	11 42 1.06	−0.006
51 G. Aquarii	6.5	21 9 53.816	−0.0010	10 56 27.70	−0.051
17 Aquarii	6.3	21 18 35.789	−0.0022	9 39 55.01	−0.021
19 Aquarii	5.6	21 20 51.977	+0.0012	10 5 38.63	−0.164
ξ Aquarii	4.8	21 33 26.480	+0.0075	− 8 13 5.17	−0.023
c^1 Capricorni	5.3	21 40 41.216	+0.0004	9 27 17.71	+0.008
c^2 Capricorni	6.3	21 41 57.077	+0.0008	9 39 1.29	+0.001
30 Aquarii	5.6	21 59 0.805	+0.0011	6 54 51.16	+0.016
138 B. Aquarii	6.4	22 8 30.812	−0.0043	5 7 14.09	−0.028
44 Aquarii	5.7	22 12 52.849	−0.0003	− 5 47 31.50	+0.029
51 Aquarii	5.8	22 19 53.756	+0.0011	5 14 50.37	−0.011
187 B. Aquarii	6.3	22 27 7.104	−0.0051	3 19 34.59	−0.004
κ Aquarii	5.2	22 33 33.747	−0.0049	4 38 46.24	−0.113
207 B. Aquarii	6.3	22 36 36.536	. . . .	3 58 32.60	. . .
6 G. Piscium	6.2	22 54 5.312	+0.0002	− 2 49 45.96	−0.082
3 Piscium	6.3	22 56 28.708	+0.0028	0 14 57.62	+0.014
22 B. Piscium	6.4	23 19 22.620	+0.0043	− 0 9 12.08	+0.038
κ Piscium	4.9	23 22 46.809	+0.0056	+ 0 48 43.44	−0.093
9 Piscium	6.4	23 23 5.844	+0.0032	0 40 39.29	−0.029
16 Piscium	5.7	23 32 15.264	−0.0074	+ 1 39 9.34	+0.057
λ Piscium	4.6	23 37 54.780	−0.0092	1 20 2.93	−0.154
19 Piscium	5.4	23 42 15.097	−0.0034	3 2 14.61	−0.020
22 Piscium	5.8	23 47 49.002	+0.0009	+ 2 28 48.34	−0.011

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
				NEW	MOON.						
τ Capricorni	5.2	-0.13	+2.8	-15 14.3	**3** 20 30.5	- 5 12.6	+0.9597	0.5572	+0.1752	+75	+17
84 B. Capricorni	6.0	0.10	3.1	12 50.7	**4** 1 43.8	- 0 9.9	-0.6024	0.5558	0.1821	+ 1	-80
ν Aquarii	4.5	0.05	3.2	11 42.0	10 23.4	+ 8 12.2	-0.1679	0.5537	0.1926	+25	-48
51 G. Aquarii	6.5	-0.03	+3.3	-10 56.4	12 33.3	+10 17.7	-0.5363	0.5532	+0.1949	+ 6	-74
17 Aquarii	6.3	-0.01	3.5	9 39.9	16 33.5	- 9 50.2	-1.0689	0.5522	0.1991	-27	-90
19 Aquarii	5.6	0.00	3.4	10 5.6	17 36.3	- 8 49.5	-0.4155	0.5520	0.2002	+13	-64
ξ Aquarii	4.8	+0.04	3.8	8 13.0	23 25.1	- 3 12.3	-1.1758	0.5508	0.2056	-35	-90
c^1 Capricorni	5.3	0.07	3.5	9 27.2	**5** 2 46.6	+ 0 2.5	+0.7982	0.5501	0.2085	+81	+ 5
c^2 Capricorni	6.3	+0.08	+3.4	- 9 39.0	3 21.8	+ 0 36.5	+1.1225	0.5500	+0.2090	+81	+28
30 Aquarii	5.6	0.14	4.0	6 54.8	11 18.1	+ 8 17.1	-0.0190	0.5488	0.2148	+36	-40
138 B. Aquarii	6.4	0.18	4.4	5 7.2	15 44.0	-11 25.8	-0.9078	0.5482	0.2175	-12	-90
44 Aquarii	5.7	0.20	4.2	5 47.5	17 46.3	- 9 27.6	+0.2283	0.5480	0.2187	+51	-26
51 Aquarii	5.8	0.23	4.2	5 14.8	21 3.1	- 6 17.2	+0.3875	0.5477	0.2203	+61	-18
187 B. Aquarii	6.3	+0.26	+4.8	- 3 19.5	**6** 0 25.8	- 3 1.1	-0.8397	0.5475	+0.2217	- 8	-90
κ Aquarii	5.2	0.29	4.4	4 38.7	3 26.7	- 0 6.2	+1.1858	0.5473	0.2228	+86	+33
207 B. Aquarii	6.3	0.31	4.5	3 58.5	4 52.2	+ 1 16.5	+0.8156	0.5472	0.2234	+87	+ 6
3 Piscium	6.3	0.41	5.5	- 0 14.9	14 10.0	+10 15.9	-0.9163	0.5473	0.2254	-11	-90
κ Piscium	4.9	0.54	5.6	+ 0 48.8	**7** 2 26.5	- 1 51.9	+0.7698	0.5484	0.2256	+90	+ 3
9 Piscium	6.4	+0.54	+5.6	+ 0 40.7	2 35.3	- 1 43.4	+0.9404	0.5484	+0.2256	+90	+14
16 Piscium	5.7	0.60	5.8	1 39.3	6 50.7	+ 2 23.5	+0.9031	0.5491	0.2249	+90	+12
19 Piscium	5.4	0.65	6.1	3 2.3	11 28.7	+ 6 52.3	+0.5294	0.5499	0.2238	+73	-10
36 Piscium	6.2	0.84	7.3	7 47.6	**8** 1 20.4	- 3 43.9	-1.2459	0.5535	0.2177	-39	-83
d Piscium	5.4	0.86	7.2	7 44.6	3 10.5	- 1 57.5	-0.7961	0.5541	0.2166	- 5	-83
136 B. Piscium	6.5	+0.99	+7.3	+ 8 54.9	12 29.7	+ 7 2.6	+0.0020	0.5573	+0.2099	+39	-36
101 Piscium	6.2	1.36	7.9	14 15.0	**9** 12 32.6	+ 6 15.1	-0.6420	0.5681	0.1842	+ 3	-73
20 H^1. Arietis	6.4	1.59	7.7	16 50.8	**10** 2 52.1	- 3 56.6	-0.7770	0.5754	0.1631	- 5	-74
27 Arietis	6.4	1.73	7.1	17 20.9	11 52.2	+ 4 43.5	+0.1153	0.5801	0.1476	+45	-23
36 Arietis	6.5	1.81	6.6	17 25.4	17 24.6	+10 3.5	+0.8281	0.5829	0.1372	+90	+18
40 Arietis	6.0	+1.84	+6.5	+17 56.9	19 8.1	+11 43.0	+0.5306	0.5837	+0.1339	+75	+ 1
45 Arietis	6.0	1.88	6.2	18 0.4	22 6.7	- 9 25.2	+0.8625	0.5852	0.1280	+90	+21
ρ Arietis	5.6	1.88	6.1	17 42.2	22 21.6	- 9 10.9	+1.2010	0.5852	0.1275	+90	+48
54 Arietis	6.5	1.96	5.8	18 29.2	**11** 3 12.2	- 4 31.3	+1.0018	0.5875	0.1176	+90	+31
δ Arietis	4.5	1.99	5.9	19 25.4	4 30.9	- 3 15.6	+0.2074	0.5881	0.1147	+50	-15
ζ Arietis	5.0	+2.03	+6.2	+20 44.8	5 49.8	- 1 59.7	-0.9823	0.5887	+0.1119	-20	-70
τ Arietis	5.2	2.07	5.9	20 51.5	8 22.4	+ 0 26.9	-0.8166	0.5897	0.1065	- 9	-70
63 Arietis	5.2	2.07	5.7	20 27.3	8 59.6	+ 1 2.9	-0.3439	0.5900	0.1051	+19	-44
65 Arietis	6.0	2.08	5.6	20 31.1	9 40.0	+ 1 41.5	-0.3380	0.5903	0.1036	+20	-44
14 H^1. Tauri	6.5	2.16	4.9	20 39.2	15 29.4	+ 7 17.4	+0.0901	0.5925	0.0905	+44	-18
22 H^1. Tauri	6.1	+2.19	+4.6	+20 40.5	17 39.9	+ 9 22.8	+0.2603	0.5933	+0.0855	+55	- 9
133 B. Tauri	5.9	2.24	4.7	22 0.0	19 48.8	+11 26.7	-0.9019	0.5940	0.0805	-15	-68
32 Tauri	5.8	2.28	4.4	22 14.8	22 33.7	- 9 54.9	-0.9398	0.5948	0.0740	-18	-68
A Tauri	4.5	2.31	3.9	21 51.8	**12** 1 39.5	- 6 56.4	-0.3334	0.5957	0.0666	+20	-40
39 Tauri	6.1	2.31	3.8	21 47.5	1 54.6	- 6 42.0	-0.2456	0.5958	0.0660	+25	-35
192 B. Tauri	6.1	+2.35	+3.5	+22 12.4	4 52.4	- 3 51.2	-0.4808	0.5965	+0.0588	+11	-49
51 Tauri	5.6	2.36	3.0	21 23.0	7 3.4	- 1 45.3	+0.4763	0.5969	0.0534	+71	+ 6
53 Tauri	5.3	2.36	2.8	20 56.9	7 28.6	- 1 21.2	+0.9391	0.5970	0.0524	+90	+33
56 Tauri	5.2	2.37	2.9	21 34.8	7 32.3	- 1 17.7	+0.3026	0.5970	0.0522	+58	- 4
227 B. Tauri	5.9	2.38	2.5	20 47.7	9 5.6	+ 0 12.0	+1.1759	0.5973	0.0485	+90	+53
κ *Tauri*	4.1	+2.41	+2.7	+22 6.6	9 47.4	+ 0 52.1	-0.1236	0.5974	+0.0467	+32	-26

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
67 Tauri	5.4	+2.41	+ 2.7	+22 1.0	**12** 9 48.6	+ 0 53.4	-0.0276	0.5974	+0.0466	+37	-21
ν Tauri	4.2	2.42	2.8	22 37.9	10 9.1	+ 1 13.0	-0.6352	0.5975	0.0458	+ 2	-60
72 Tauri	5.4	2.43	2.8	22 48.9	10 32.4	+ 1 35.3	-0.8041	0.5976	0.0448	- 8	-68
247 B. Tauri	5.8	2.41	2.4	21 26.4	10 50.3	+ 1 52.6	+0.6026	0.5976	0.0440	+83	+14
284 B. Tauri	6.0	2.48	2.3	23 10.6	14 8.3	+ 5 2.7	-1.0255	0.5981	0.0358	-25	-67
τ Tauri	4.3	+2.49	+ 1.9	+22 48.2	16 24.2	+ 7 13.2	-0.5722	0.5983	+0.0301	+ 6	-54
300 B. Tauri	6.2	2.52	1.9	23 28.9	17 45.1	+ 8 30.8	-1.2217	0.5984	0.0267	-47	-67
ι Tauri	4.7	2.55	0.3	21 28.5	**13** 0 35.3	- 8 55.2	+0.9374	0.5985	0.0094	+90	+37
330 B. Tauri	6.3	2.55	0.2	21 9.9	1 5.4	- 8 26.3	+1.2568	0.5985	0.0082	+79	+66
105 Tauri	6.0	2.57	+ 0.2	21 35.9	2 28.9	- 7 6.1	+0.8258	0.5985	+0.0046	+90	+30
108 Tauri	6.2	+2.60	- 0.3	+22 11.6	5 25.8	- 4 16.2	+0.2247	0.5983	-0.0028	+52	- 3
n Tauri	5.1	2.61	0.6	22 0.8	6 55.8	- 2 49.9	+0.4001	0.5982	0.0066	+65	+ 6
o Tauri	4.8	2.63	1.2	21 52.1	10 13.0	+ 0 19.6	+0.5126	0.5977	0.0149	+74	+11
ζ Tauri	3.0	2.65	2.0	21 5.6	14 10.2	+ 4 7.4	+1.2236	0.5970	0.0248	+87	+60
175 H^1. Tauri	6.5	2.69	2.0	22 37.2	15 53.6	+ 5 46.7	-0.3782	0.5966	0.0291	+17	-40
394 B. Tauri	6.0	+2.70	- 1.9	+23 10.0	16 23.0	+ 6 14.9	-0.9486	0.5965	-0.0303	-19	-67
141 Tauri	6.3	2.73	3.3	22 24.0	23 40.8	-10 44.4	-0.4545	0.5945	0.0482	+13	-46
14 B. Geminorum	6.0	2.74	3.8	22 12.2	**14** 2 48.8	- 7 43.8	-0.4175	0.5934	0.0558	+15	-45
6 Geminorum	6.3	2.76	3.9	22 55.6	3 54.8	- 6 40.5	-1.2203	0.5930	0.0584	-46	-68
η Gemin. (*var.*)	3.2	2.76	4.1	22 31.8	4 56.8	- 5 40.8	-0.8768	0.5926	0.0608	-13	-68
μ Geminorum	3.2	+2.77	- 4.6	+22 30.3	8 11.4	- 2 33.8	-1.1128	0.5913	-0.0684	-32	-68
15 Geminorum	6.5	2.74	5.1	20 50.3	10 9.6	- 0 40.1	+0.5045	0.5904	0.0730	+73	+ 5
16 Geminorum	6.2	2.74	5.2	20 32.7	10 14.0	- 0 36.0	+0.8006	0.5904	0.0732	+90	+22
ν Geminorum	4.1	2.74	5.2	20 15.8	10 38.8	- 0 12.1	+1.0583	0.5902	0.0741	+90	+40
ζ Gemin. (*var.*)	3.7	2.77	7.4	20 41.3	**15** 1 1.9	-10 21.8	-0.6722	0.5828	0.1054	+ 1	-67
f Geminorum	5.3	+2.72	- 9.5	+17 51.5	15 59.2	+ 4 2.5	+0.4520	0.5735	-0.1341	+68	- 4
g Geminorum	5.0	2.73	9.8	18 42.4	18 50.4	+ 6 47.5	-0.8169	0.5715	0.1391	- 8	-72
1 Cancri	6.0	2.69	10.4	16 0.3	23 35.6	+11 22.6	+1.3060	0.5683	0.1470	+76	+63
2 B. Cancri	6.0	2.70	10.4	16 44.1	**16** 0 15.2	-11 59.3	+0.4501	0.5679	0.1481	+67	- 5
3 Cancri	5.7	2.70	10.6	17 31.7	1 14.1	-11 2.4	-0.5206	0.5672	0.1497	+10	-61
5 Cancri	5.9	+2.69	-10.6	+16 40.6	1 33.6	-10 43.5	+0.3163	0.5670	-0.1502	+58	-13
29 Cancri	5.9	2.63	11.8	14 28.6	13 39.9	+ 0 57.5	+0.6852	0.5586	0.1677	+90	+ 5
84 B. Cancri	6.4	2.61	11.9	13 31.9	16 0.2	+ 3 13.0	+1.2789	0.5570	0.1707	+87	+52
90 B. Cancri	6.3	2.63	12.2	15 35.5	17 3.6	+ 4 14.3	-1.0577	0.5562	0.1721	-24	-75
A^1 Cancri	5.5	2.59	12.2	12 58.1	20 19.9	+ 7 23.9	+1.1202	0.5540	0.1760	+90	+34
60 Cancri	5.7	+2.56	-12.6	+11 56.0	**17** 2 13.8	-10 54.0	+1.1528	0.5500	-0.1826	+90	+35
α Cancri	4.3	2.55	12.7	12 10.1	3 25.3	- 9 44.8	+0.6872	0.5491	0.1839	+90	+ 3
κ Cancri	5.1	2.52	12.9	10 59.5	7 47.3	- 5 31.4	+1.1161	0.5462	0.1882	+90	+32
209 B. Cancri	6.5	2.52	13.1	11 53.5	8 44.4	- 4 36.2	-0.0122	0.5456	0.1891	+38	-35
222 B. Cancri	6.3	2.50	13.3	11 50.2	12 35.1	- 0 52.9	-0.6898	0.5432	0.1926	+ 1	-78
ω Leonis	5.5	+2.46	-13.3	+ 9 24.4	17 41.8	+ 4 4.0	+0.8876	0.5400	-0.1967	+90	+14
h Leonis	5.2	2.45	13.5	10 4.2	19 23.4	+ 5 42.3	-0.1491	0.5389	0.1979	+30	-44
ο Leonis	3.8	2.43	13.8	10 15.5	23 52.4	+10 2.8	-1.2443	0.5362	0.2009	-40	-80
89 B. Leonis	6.2	2.37	13.9	8 41.8	**18** 8 15.9	- 5 49.2	-1.2948	0.5316	0.2057	-46	-82
π Leonis	4.9	2.36	13.9	8 25.8	9 18.5	- 4 48.6	-1.2245	0.5310	0.2062	-37	-82
14 Sextantis	6.3	+2.33	-13.5	+ 6 0.2	12 37.2	- 1 36.0	+0.6820	0.5293	-0.2076	+88	0
19 Sextantis	5.9	2.31	13.4	5 0.7	15 39.4	+ 1 20.8	+1.1124	0.5278	0.2088	+90	+28
155 B. Leonis	6.5	2.28	13.8	6 6.1	20 56.9	+ 6 28.6	-1.1658	0.5254	0.2105	-31	-84
237 B. Leonis	6.3	2.17	12.9	1 27.1	**19** 11 53.2	- 3 1.6	+0.6771	0.5195	0.2128	+87	- 2
55 Leonis	6.1	2.16	12.8	1 9.9	13 41.6	- 1 16.5	+0.6020	0.5189	0.2128	+79	- 6
p^3 Leonis	6.1	+2.13	-12.7	+ 0 25.9	17 49.9	+ 2 44.6	+0.5164	0.5176	-0.2127	+77	[illegible]

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's						At Conjunction in R. A.					Limiting Parallels.	
Name.		Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
			Δα	Δδ								
			s	″	° ′	d h m	h m				°	°
p^5	Leonis	5.3	+2.09	−12.7	+ 0 22.1	**19** 23 9.4	+ 7 54.9	−0.5458	0.5162	−0.2123	+10	−74
388 B.	Leonis	6.3	2.04	12.2	− 1 15.4	**20** 6 37.0	− 8 50.4	−0.3594	0.5146	0.2111	+19	−60
e	Leonis	5.1	2.03	11.8	2 33.6	7 53.9	− 7 35.7	+0.7894	0.5143	0.2108	+88	+ 4
431 B.	Leonis	6.2	1.99	11.9	1 59.5	12 11.0	− 3 26.0	−0.7312	0.5136	0.2096	− 2	−90
13 B.	Virginis	5.9	1.95	10.9	4 53.1	18 53.9	+ 3 5.4	+1.0317	0.5128	0.2074	+86	+20
78 B.	Virginis	6.5	+1.86	−10.5	− 5 16.3	**21** 7 15.7	− 8 54.0	−1.0761	0.5122	−0.2018	−25	−90
q	Virginis	5.3	1.79	8.9	9 0.5	17 38.1	+ 1 10.6	+0.9700	0.5126	0.1956	+82	+16
χ	Virginis	4.8	1.76	9.3	7 33.2	20 32.4	+ 3 59.9	−1.1981	0.5129	0.1937	−37	−90
370 B.	Virginis	6.0	1.71	7.8	11 12.7	**22** 4 30.2	+11 43.9	+1.3175	0.5140	0.1878	+80	+51
ψ	Virginis	5.0	1.70	8.5	9 6.1	4 31.5	+11 45.1	−1.0153	0.5139	0.1878	−22	−90
49	Virginis	5.2	+1.64	− 7.8	−10 18.6	11 39.0	− 5 19.7	−0.9998	0.5152	−0.1819	−22	−90
i	Virginis	5.7	1.57	6.6	12 17.3	21 28.9	+ 4 13.0	−0.5590	0.5176	0.1729	+ 4	−76
550 B.	Virginis	6.0	1.54	6.2	12 48.1	**23** 1 36.1	+ 8 13.1	−0.6958	0.5187	0.1687	− 4	−90
85	Virginis	6.1	1.51	5.0	15 21.7	7 12.7	−10 20.2	+1.2077	0.5204	0.1628	+75	+38
621 B.	Virginis	6.4	1.41	4.8	14 35.0	16 51.3	− 0 58.9	−1.1705	0.5237	0.1517	−40	−90
214 G.	Virginis	6.5	+1.42	− 4.3	−15 57.0	17 14.3	− 0 36.5	+0.2825	0.5239	−0.1512	+47	−23
40 H.	Virginis	5.1	1.39	4.2	15 55.3	20 4.7	+ 2 8.7	−0.1739	0.5249	0.1477	+21	−49
ι	Libræ	4.7	1.12	1.2	19 29.2	**25** 2 19.6	+ 7 27.4	−0.0803	0.5379	0.1047	+21	−43
25	Libræ	6.0	1.11	1.3	19 20.6	2 51.5	+ 7 58.3	−0.2931	0.5381	0.1038	+10	−57
147 B.	Libræ	6.2	1.04	0.5	20 27.0	11 6.1	− 8 3.0	+0.1251	0.5419	0.0902	+31	−32
150 B.	Libræ	6.1	+1.03	− 0.6	−19 53.3	11 38.6	− 7 31.6	−0.5413	0.5422	−0.0893	− 5	−76
11 H.	Libræ	5.4	1.02	0.8	19 23.7	12 4.1	− 7 6.9	−1.1212	0.5424	0.0886	−43	−90
172 B.	Libræ	5.9	1.00	− 0.2	20 44.9	14 43.3	− 4 32.9	+0.1371	0.5436	0.0840	+31	−31
10 G.	Scorpii	5.9	0.91	+ 0.2	20 44.9	23 49.0	+ 4 14.9	−0.5532	0.5477	0.0678	− 8	−78
δ	Scorpii	2.5	0.91	0.9	22 23.5	**26** 1 1.7	+ 5 25.2	+1.1652	0.5483	0.0656	+68	+38
ω^1	Scorpii	4.3	+0.86	+ 0.4	−20 27.0	4 3.3	+ 8 20.8	−1.1491	0.5496	−0.0600	−49	−90
ω^2	Scorpii	4.6	0.86	0.5	20 39.1	4 19.6	+ 8 36.5	−0.9464	0.5497	0.0595	−33	−90
84 B.	Scorpii	6.3	0.83	0.7	20 54.1	7 35.2	+11 45.6	−0.8542	0.5511	0.0533	−27	−90
51 G.	Scorpii	6.5	0.82	0.8	21 6.2	8 43.9	−11 8.0	−0.6945	0.5516	0.0511	−18	−90
ω	Ophiuchi	4.5	0.75	1.2	21 17.6	15 39.1	− 4 26.7	−0.7920	0.5544	0.0377	−25	−90
24	Ophiuchi	5.5	+0.65	+ 2.2	−23 1.3	**27** 2 45.7	+ 6 17.2	+0.7913	0.5586	−0.0153	+67	+ 8
116 B.	Ophiuchi	6.3	0.60	1.9	21 27.2	6 59.5	+10 22.1	−0.9550	0.5600	−0.0066	−38	−90
190 B.	Ophiuchi	5.9	0.53	2.2	21 22.0	15 13.4	− 5 41.1	−1.0283	0.5624	+0.0106	−43	−90
52	Ophiuchi	6.4	0.49	2.5	21 59.4	19 54.2	− 1 10.0	−0.2837	0.5636	0.0205	+ 2	−56
58	Ophiuchi	4.8	0.46	2.5	21 38.7	23 29.6	+ 2 17.8	−0.5669	0.5645	0.0280	−13	−79
21 G.	Sagittarii	5.7	+0.39	+ 3.0	−22 46.7	**28** 7 35.2	+10 6.2	+0.9447	0.5660	+0.0452	+68	+18
30 G.	Sagittarii	6.2	0.37	2.8	21 27.1	9 55.4	−11 38.5	−0.3620	0.5664	0.0502	0	−62
μ	Sagittarii	4.0	0.34	2.8	21 4.8	12 48.3	− 8 51.7	−0.6050	0.5668	0.0563	−12	−83
14	Sagittarii	5.6	0.34	2.9	21 44.1	13 0.9	− 8 39.6	+0.1052	0.5669	0.0567	+27	−33
15	Sagittarii	5.3	0.34	2.7	20 45.2	13 26.8	− 8 14.6	−0.9180	0.5669	0.0576	−31	−90
21	Sagittarii	5.0	+0.30	+ 2.8	−20 35.1	17 52.7	− 3 58.1	−0.8180	0.5674	+0.0670	−24	−90
115 B.	Sagittarii	5.7	0.27	3.0	21 27.9	23 20.8	+ 1 18.3	+0.5148	0.5678	0.0784	+54	−10
121 B.	Sagittarii	5.9	0.27	3.0	21 7.1	23 47.0	+ 1 43.7	+0.1819	0.5678	0.0793	+33	−28
128 B.	Sagittarii	6.3	0.25	3.0	21 5.0	**29** 2 34.9	+ 4 25.5	+0.3744	0.5679	0.0851	+45	−18
29	Sagittarii	5.3	0.23	3.0	20 25.0	4 29.7	+ 6 16.2	−0.1655	0.5680	0.0890	+15	−49
33	Sagittarii	5.8	+0.23	+ 3.2	−21 27.5	6 22.1	+ 8 4.6	+1.1065	0.5680	+0.0928	+69	+31
36	Sagittarii	5.1	0.22	3.1	20 45.8	7 50.2	+ 9 29.7	+0.5082	0.5680	0.0958	+55	−10
ξ	Sagittarii	3.7	0.22	3.1	21 12.8	8 0.0	+ 9 39.0	+0.9999	0.5680	0.0961	+69	+22
171 B.	Sagittarii	6.1	0.20	2.9	19 21.8	10 21.4	+11 55.5	−0.7212	0.5680	0.1008	−15	−90
173 B.	Sagittarii	6.4	+0.20	+ 2.8	−19 13.2	10 22.9	+11 56.9	−0.8697	0.5680	+0.1009	−24	−90
					NEW	*MOON.*						

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0. Δα	Red'ns from 1919.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° ′	d h m	h m				°	°
207 B. Aquarii	6.3	+0.20	+3.2	− 3 58.5	2 11 40.0	+ 9 51.8	+0.6590	0.5563	+0.2253	+83	− 3
3 Piscium	6.3	0.26	3.7	0 14.9	20 42.5	− 5 24.1	−1.0679	0.5562	0.2275	−23	−90
22 B. Piscium	6.4	0.33	3.6	− 0 9.1	3 7 7.0	+ 4 39.3	+1.2059	0.5566	0.2278	+90	+35
κ Piscium	4.9	0.34	3.8	+ 0 48.8	8 39.6	+ 6 8.7	+0.5816	0.5567	0.2276	+76	− 7
9 Piscium	6.4	0.35	3.8	0 40.7	8 48.2	+ 6 17.0	+0.7503	0.5567	0.2276	+90	+ 2
16 Piscium	5.7	+0.38	+3.9	+ 1 39.2	12 57.3	+10 17.6	+0.7080	0.5571	+0.2268	+90	0
19 Piscium	5.4	0.42	4.2	3 2.3	17 28.6	− 9 20.3	+0.3327	0.5577	0.2256	+58	−20
d Piscium	5.4	0.58	5.0	7 44.5	4 8 50.2	+ 5 29.8	−0.9975	0.5604	0.2181	−19	−82
136 B. Piscium	6.5	0.68	5.1	8 54.9	17 59.7	− 9 39.9	−0.2134	0.5627	0.2112	+27	−48
101 Piscium	6.2	1.00	5.9	14 15.0	5 17 46.7	−10 43.6	−0.8663	0.5703	0.1846	−10	−76
20 H^1. Arietis	6.4	+1.22	+5.9	+16 50.8	6 8 4.1	+ 3 2.7	−1.0034	0.5755	+0.1630	−21	−73
19 Arietis	5.8	1.23	5.2	14 54.1	9 37.8	+ 4 33.0	+1.2160	0.5761	0.1604	+90	+46
27 Arietis	6.4	1.35	5.5	17 20.9	17 5.6	+11 44.3	−0.1092	0.5788	0.1474	+32	−35
36 Arietis	6.5	1.44	5.1	17 25.4	22 39.9	− 6 53.9	+0.6072	0.5807	0.1370	+82	+ 5
40 Arietis	6.0	1.47	5.1	17 56.9	7 0 24.2	− 5 13.5	+0.3099	0.5814	0.1336	+57	−11
π Arietis	5.2	+1.46	+4.8	+17 7.8	0 43.6	− 4 55.0	+1.1833	0.5815	+0.1330	+90	+46
45 Arietis	6.0	1.51	4.9	18 0.3	3 24.3	− 2 20.2	+0.6446	0.5823	0.1277	+86	+ 9
ρ Arietis	5.6	1.52	4.7	17 42.1	3 39.3	− 2 5.8	+0.9843	0.5824	0.1272	+90	+30
54 Arietis	6.5	1.60	4.6	18 29.2	8 33.0	+ 2 36.8	+0.7879	0.5840	0.1173	+90	+18
δ Arietis	4.5	1.63	4.8	19 25.4	9 52.6	+ 3 53.4	−0.0087	0.5844	0.1145	+38	−26
ζ Arietis	5.0	+1.66	+5.1	+20 44.8	11 12.4	+ 5 10.1	−1.2028	0.5848	+0.1117	−42	−70
τ Arietis	5.2	1.70	4.9	20 51.4	13 47.0	+ 7 38.9	−1.0351	0.5856	0.1063	−25	−69
63 Arietis	5.2	1.71	4.7	20 27.3	14 24.7	+ 8 15.2	−0.5597	0.5858	0.1049	+ 7	−59
65 Arietis	6.0	1.72	4.7	20 31.1	15 5.6	+ 8 54.6	−0.5534	0.5859	0.1034	+ 7	−58
14 H^1. Tauri	6.5	1.81	4.1	20 39.2	21 0.2	− 9 24.5	−0.1186	0.5874	0.0904	+31	−29
13 Tauri	5.6	+1.81	+3.5	+19 26.6	22 21.6	− 8 6.2	+1.2347	0.5877	+0.0874	+88	+57
22 H^1. Tauri	6.1	1.84	3.8	20 40.5	23 12.9	− 7 16.9	+0.0544	0.5879	0.0855	+41	−20
133 B. Tauri	5.9	1.90	4.0	22 0.0	8 1 24.0	− 5 10.8	−1.1134	0.5884	0.0805	−33	−68
32 Tauri	5.8	1.94	3.8	22 14.8	4 11.8	− 2 29.4	−1.1494	0.5890	0.0741	−37	−68
A Tauri	4.5	1.98	3.3	21 51.8	7 21.2	+ 0 32.7	−0.5360	0.5895	0.0668	+ 7	−54
39 Tauri	6.1	+1.99	+3.2	+21 47.5	7 36.5	+ 0 47.3	−0.4473	0.5895	+0.0662	+13	−47
192 B. Tauri	6.1	2.03	3.0	22 12.4	10 37.8	+ 3 41.7	−0.6815	0.5899	0.0591	− 1	−65
51 Tauri	5.6	2.05	2.4	21 23.0	12 51.6	+ 5 50.3	+0.2854	0.5902	0.0538	+56	− 4
53 Tauri	5.3	2.05	2.2	20 56.9	13 17.4	+ 6 15.1	+0.7525	0.5902	0.0528	+90	+22
56 Tauri	5.2	2.06	2.4	21 34.8	13 21.1	+ 6 18.7	+0.1109	0.5903	0.0527	+45	−13
224 B. Tauri	6.1	+2.06	+2.0	+20 37.9	14 28.6	+ 7 23.6	+1.1370	0.5903	+0.0500	+90	+50
227 B. Tauri	5.9	2.07	2.0	20 47.7	14 56.4	+ 7 50.2	+0.9932	0.5904	0.0489	+90	+39
κ Tauri	4.1	2.10	2.3	22 6.6	15 39.1	+ 8 31.3	−0.3164	0.5904	0.0472	+20	−37
67 Tauri	5.4	2.10	2.3	22 1.0	15 40.4	+ 8 32.6	−0.2196	0.5904	0.0471	+26	−31
υ Tauri	4.2	2.12	2.5	22 37.9	16 1.3	+ 8 52.6	−0.8319	0.5905	0.0463	−11	−67
72 Tauri	5.4	+2.13	+2.5	+22 48.9	16 25.1	+ 9 15.5	−1.0018	0.5905	+0.0453	−23	−67
247 B. Tauri	5.8	2.11	2.0	21 26.4	16 43.3	+ 9 33.0	+0.4171	0.5905	0.0446	+66	+ 3
284 B. Tauri	6.0	2.18	2.1	23 10.6	20 5.8	−11 12.3	−1.2214	0.5907	0.0365	−48	−67
τ Tauri	4.3	2.21	1.7	22 48.2	22 24.8	− 8 58.7	−0.7615	0.5908	0.0309	− 6	−67
ι Tauri	4.7	2.30	+0.1	21 28.5	9 6 47.7	− 0 55.4	+0.7728	0.5906	0.0106	+90	+27
330 B. Tauri	6.3	+2.30	−0.1	+21 9.9	7 18.5	− 0 25.8	+1.0960	0.5905	+0.0094	+90	+49
105 Tauri	6.0	2.32	0.2	21 35.9	8 44.1	+ 0 56.5	+0.6627	0.5904	+0.0059	+90	+21
108 Tauri	6.2	2.37	0.4	22 11.6	11 45.4	+ 3 50.8	+0.0597	0.5901	−0.0014	+42	−12
n Tauri	5.1	2.39	0.7	22 0.8	13 17.7	+ 5 19.6	+0.2391	0.5899	0.0051	+53	− 3
o Tauri	4.8	2.42	1.2	21 52.1	16 40.0	+ 8 34.0	+0.3575	0.5894	0.0132	+61	+ 3
ζ Tauri	3.0	+2.46	−2.1	+21 5.6	20 43.4	−11 32.0	+1.0821	0.5886	−0.0229	+90	+47

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallel	
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
175 H¹. Tauri	6.5	+2.50	− 1.9	+22 37.2	9 22 29.5	− 9 49.9	−0.5342	0.5882	−0.0272	+ 8	−50
394 B. Tauri	6.0	2.52	1.8	23 10.0	22 59.6	− 9 20.9	−1.1099	0.5881	0.0284	−33	−67
141 Tauri	6.3	2.58	3.2	22 24.0	10 6 28.9	− 2 8.7	−0.5991	0.5861	0.0459	+ 4	−57
14 B. Geminorum	6.0	2.61	3.7	22 12.2	9 41.9	+ 0 56.9	−0.5564	0.5851	0.0532	+ 6	−54
η Gemin. (*var.*)	3.2	2.64	3.9	22 31.8	11 53.3	+ 3 3.4	−1.0172	0.5843	0.0582	−24	−67
μ Geminorum	3.2	+2.67	− 4.4	+22 33.3	15 12.9	+ 6 15.4	−1.2501	0.5831	−0.0657	−52	−67
15 Geminorum	6.5	2.66	5.2	20 50.3	17 14.2	+ 8 12.1	+0.3885	0.5824	0.0702	+63	0
16 Geminorum	6.2	2.65	5.2	20 32.7	17 18.6	+ 8 16.3	+0.6879	0.5823	0.0703	+90	+16
ν Geminorum	4.1	2.65	5.4	20 15.8	17 44.2	+ 8 41.0	+0.9492	0.5822	0.0712	+90	+33
ζ Gemin. (*var.*)	3.7	2.77	7.4	20 41.3	11 8 28.7	− 1 7.3	−0.7732	0.5755	0.1021	− 6	−69
f Geminorum	5.3	+2.80	−10.0	+17 51.4	23 46.2	−10 22.6	+0.3932	0.5675	−0.1306	+63	− 6
g Geminorum	5.0	2.83	10.3	18 42.4	12 2 41.0	− 7 34.3	−0.8818	0.5658	0.1355	−13	−71
1 Cancri	6.0	2.80	11.3	16 0.3	7 31.7	− 2 53.6	+1.2711	0.5630	0.1435	+85	+56
2 B. Cancri	6.0	2.82	11.2	16 44.1	8 12.0	− 2 14.8	+0.4089	0.5626	0.1445	+64	− 7
3 Cancri	5.7	2.83	11.2	17 31.7	9 12.0	− 1 16.8	−0.5684	0.5621	0.1461	+ 7	−64
5 Cancri	5.9	+2.82	−11.4	+16 40.6	9 31.8	− 0 57.6	+0.2766	0.5619	−0.1466	+55	−14
29 Cancri	5.9	2.82	13.0	14 28.6	21 50.3	+10 55.6	+0.6755	0.5548	0.1643	+89	+ 5
84 B. Cancri	6.4	2.82	13.4	13 31.9	13 0 12.6	−10 46.8	+1.2791	0.5534	0.1673	+87	+53
90 B. Cancri	6.3	2.84	13.2	15 35.5	1 16.8	− 9 44.7	−1.0729	0.5528	0.1687	−26	−74
*A*¹ Cancri	5.5	2.82	13.8	12 58.1	4 35.7	− 6 32.4	+1.1287	0.5509	0.1728	+90	+35
60 Cancri	5.7	+2.81	−14.4	+11 55.9	10 33.9	− 0 46.1	+1.1748	0.5476	−0.1795	+90	+38
α Cancri	4.3	2.82	14.5	12 10.1	11 46.2	+ 0 23.9	+0.7087	0.5468	0.1808	+90	+ 5
κ Cancri	5.1	2.81	15.0	10 59.4	16 10.8	+ 4 40.1	+1.1503	0.5444	0.1853	+90	+35
209 B. Cancri	6.5	2.82	15.0	11 53.4	17 8.3	+ 5 35.6	+0.0176	0.5439	0.1862	+39	−33
222 B. Cancri	6.3	2.82	15.3	11 50.2	21 1.0	+ 9 20.8	−0.6545	0.5418	0.1898	+ 2	−76
ω Leonis	5.5	+2.79	−15.7	+ 9 24.3	14 2 9.9	− 9 40.1	+0.9432	0.5392	−0.1940	+90	+18
h Leonis	5.2	2.80	15.8	10 4.2	3 52.0	− 8 1.3	−0.0945	0.5383	0.1954	+33	−41
ο Leonis	3.8	2.79	16.0	10 15.4	8 22.3	− 3 39.4	−1.1834	0.5361	0.1986	−34	−80
89 B. Leonis	6.2	2.77	16.5	8 41.8	16 47.4	+ 4 30.1	−1.2129	0.5322	0.2036	−37	−81
π Leonis	4.9	2.77	16.6	8 25.7	17 50.1	+ 5 30.8	−1.1399	0.5317	0.2042	−30	−82
14 Sextantis	6.3	+2.75	−16.7	+ 6 0.2	21 9.0	+ 8 43.7	+0.7803	0.5304	−0.2057	+90	+ 6
19 Sextantis	5.9	2.74	16.8	5 0.7	15 0 11.2	+11 40.4	+1.2187	0.5291	0.2070	+90	+38
155 B. Leonis	6.5	2.73	17.0	6 6.1	5 28.5	− 7 11.9	−1.0525	0.5271	0.2089	−23	−84
237 B. Leonis	6.3	2.68	16.9	1 27.0	20 22.1	+ 7 15.1	+0.8268	0.5222	0.2118	+90	+ 7
55 Leonis	6.1	2.68	16.9	1 9.9	22 10.0	+ 8 59.8	+0.7554	0.5219	0.2119	+90	+ 3
*p*³ Leonis	6.1	+2.67	−16.8	+ 0 25.9	16 2 16.9	−11 0.5	+0.6784	0.5207	−0.2120	+86	− 1
*p*⁵ Leonis	5.3	2.66	16.8	+ 0 22.0	7 34.5	− 5 52.3	−0.3731	0.5195	0.2117	+18	−60
388 B. Leonis	6.3	2.62	16.6	− 1 15.5	14 59.1	+ 1 19.5	−0.1717	0.5181	0.2106	+29	−47
e Leonis	5.1	2.62	16.4	2 33.6	16 15.4	+ 2 33.6	+0.9791	0.5179	0.2104	+87	+17
431 B. Leonis	6.2	2.60	16.4	1 59.6	20 30.6	+ 6 41.4	−0.5326	0.5173	0.2093	+ 9	−72
13 B. Virginis	5.9	+2.58	−15.8	− 4 53.2	17 3 10.4	−10 50.3	+1.2411	0.5166	−0.2073	+85	+39
78 B. Virginis	6.5	2.53	15.3	5 16.4	15 26.1	+ 1 4.2	−0.8444	0.5160	0.2017	−10	−90
q Virginis	5.3	2.50	14.1	9 0.6	18 1 43.6	+11 3.9	+1.2144	0.5163	0.1956	+81	+37
χ Virginis	4.8	2.48	14.3	7 33.2	4 36.6	−10 8.1	−0.9475	0.5165	0.1936	−17	−90
ψ Virginis	5.0	2.44	13.5	9 6.2	12 32.4	− 2 26.1	−0.7553	0.5173	0.1879	− 6	−90
49 Virginis	5.2	+2.41	−12.8	−10 18.7	19 37.2	+ 4 26.3	−0.7325	0.5182	−0.1819	− 6	−90
i Virginis	5.7	2.36	11.6	12 17.4	19 5 24.4	−10 3.7	−0.2831	0.5200	0.1727	+18	−55
550 B. Virginis	6.0	2.34	11.2	12 48.1	9 30.7	− 6 4.6	−0.4169	0.5208	0.1686	+11	−64
621 B. Virginis	6.4	2.25	9.6	14 35.1	20 0 44.6	+ 8 42.1	−0.8836	0.5248	0.1514	−18	−90
214 G. Virginis	6.5	2.26	9.1	15 57.1	1 7.5	+ 9 4.4	+0.5709	0.5249	0.1509	+65	− 6
40 H. Virginis	5.1	+2.24	− 8.9	−15 55.3	3 58.1	+11 49.8	+0.1151	0.5257	−0.1474	+37	−32

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's						At Conjunction in R. A.					Limiting Parallels.	
	Name.	Mag.	Red'ns from 1919.0. Δα	Red'ns from 1919.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
			s	″	° ′	d h m	h m				°	°
ι	Libræ	4.7	+2.02	−5.1	−19 29.3	**21** 10 21.8	− 6 42.7	+0.2114	0.5360	−0.1043	+37	−26
25	Libræ	6.0	2.02	5.1	19 20.7	10 53.9	− 6 11.6	−0.0023	0.5362	0.1034	+25	−38
147 B.	Libræ	6.2	1.95	4.0	20 27.1	19 13.4	+ 1 52.0	+0.4152	0.5392	0.0899	+48	−15
150 B.	Libræ	6.1	1.93	4.1	19 53.4	19 46.2	+ 2 23.7	−0.2541	0.5395	0.0890	+10	−54
11 H.	Libræ	5.4	1.92	4.2	19 23.8	20 12.0	+ 2 48.7	−0.8365	0.5396	0.0883	−23	−90
172 B.	Libræ	5.9	+1.92	−3.5	−20 45.0	22 53.0	+ 5 24.6	+0.4259	0.5406	−0.0837	+48	−14
κ	Libræ	5.0	1.88	3.8	19 25.1	**22** 0 39.6	+ 7 7.8	−1.1886	0.5412	0.0807	−52	−90
λ	Libræ	5.1	1.83	3.2	19 55.6	6 3.3	−11 39.0	−1.0366	0.5432	0.0713	−39	−90
10 G.	Scorpii	5.9	1.82	2.7	20 45.0	8 5.6	− 9 40.7	−0.2721	0.5440	0.0677	+ 7	−55
ω^1	Scorpii	4.3	1.77	2.4	20 27.1	12 23.4	− 5 31.3	−0.8737	0.5455	0.0599	−28	−90
ω^2	Scorpii	4.6	+1.77	−2.3	−20 39.1	12 40.0	− 5 15.2	−0.6700	0.5456	−0.0594	−16	−90
84 B.	Scorpii	6.3	1.74	1.9	20 54.2	15 58.5	− 2 3.2	−0.5797	0.5467	0.0533	−11	−80
51 G.	Scorpii	6.5	1.73	1.8	21 6.2	17 8.2	− 0 55.8	−0.4200	0.5472	0.0512	− 3	−66
ω	Ophiuchi	4.5	1.65	−1.1	21 17.7	**23** 0 9.9	+ 5 51.8	−0.5236	0.5495	0.0380	− 9	−74
24	Ophiuchi	5.5	1.54	+0.5	23 1.4	11 27.9	− 7 12.8	+1.0587	0.5531	0.0160	+67	+27
116 B.	Ophiuchi	6.3	+1.47	+0.3	−21 27.2	15 46.2	− 3 3.3	−0.7024	0.5544	−0.0075	−23	−90
ξ	Ophiuchi	4.4	1.39	0.7	21 1.6	22 28.6	+ 3 25.4	−1.1685	0.5562	+0.0060	−56	−90
190 B.	Ophiuchi	5.9	1.38	0.9	21 22.0	**24** 0 9.0	+ 5 2.4	−0.7855	0.5566	0.0094	−28	−90
52	Ophiuchi	6.4	1.33	1.5	21 59.4	4 55.0	+ 9 38.6	−0.0422	0.5577	0.0191	+14	−40
58	Ophiuchi	4.8	1.28	1.7	21 38.7	8 34.3	−10 49.6	−0.3318	0.5585	0.0265	− 1	−59
21 G.	Sagittarii	5.7	+1.20	+2.6	−22 46.7	16 48.6	− 2 52.3	+1.1771	0.5601	+0.0434	+67	+41
30 G.	Sagittarii	6.2	1.16	2.3	21 27.2	19 11.3	− 0 34.6	−0.1403	0.5605	0.0483	+12	−46
μ	Sagittarii	4.0	1.12	2.4	21 4.8	22 7.2	+ 2 15.3	−0.3889	0.5610	0.0542	− 1	−63
14	Sagittarii	5.6	1.13	2.6	21 44.1	22 20.0	+ 2 27.6	+0.3248	0.5610	0.0547	+39	−20
15	Sagittarii	5.3	1.11	2.3	20 45.2	22 46.3	+ 2 52.9	−0.7046	0.5611	0.0556	−18	−90
16	Sagittarii	5.9	+1.11	+2.2	−20 24.8	22 46.7	+ 2 53.3	−1.0689	0.5611	+0.0556	−42	−90
21	Sagittarii	5.0	1.06	2.6	20 35.1	**25** 3 16.7	+ 7 13.9	−0.6110	0.5617	0.0647	−12	−83
115 B.	Sagittarii	5.7	1.00	3.2	21 27.9	8 50.1	−11 24.3	+0.7193	0.5624	0.0760	+68	+ 3
121 B.	Sagittarii	5.9	1.00	3.1	21 7.1	9 16.8	−10 58.6	+0.3841	0.5624	0.0768	+45	−16
128 B.	Sagittarii	6.3	0.97	3.2	21 5.0	12 7.3	− 8 14.0	+0.5726	0.5627	0.0826	+58	− 5
29	Sagittarii	5.3	+0.94	+3.2	−20 25.0	14 3.8	− 6 21.6	+0.0269	0.5628	+0.0864	+24	−36
36	Sagittarii	5.1	0.90	3.4	20 45.7	17 27.2	− 3 5.2	+0.6973	0.5631	0.0931	+68	+ 2
ξ	Sagittarii	3.7	0.90	3.5	21 12.8	17 37.0	− 2 55.8	+1.1908	0.5631	0.0935	+69	+41
171 B.	Sagittarii	6.1	0.87	3.1	19 21.8	20 0.4	− 0 37.4	−0.5418	0.5632	0.0981	− 5	−76
173 B.	Sagittarii	6.4	0.87	3.1	19 13.2	20 2.0	− 0 35.9	−0.6908	0.5633	0.0982	−13	−90
187 B.	Sagittarii	6.4	+0.85	+3.0	−18 51.8	21 49.1	+ 1 7.5	−0.8892	0.5633	+0.1017	−25	−90
190 B.	Sagittarii	5.4	0.85	3.2	19 25.0	22 18.8	+ 1 36.2	−0.2524	0.5633	0.1026	+11	−53
195 B.	Sagittarii	6.3	0.84	3.4	19 55.9	22 58.7	+ 2 14.7	+0.3598	0.5634	0.1039	+45	−18
d	Sagittarii	5.0	0.80	3.3	19 5.8	**26** 2 27.4	+ 5 36.0	−0.1483	0.5635	0.1106	+17	−47
226 B.	Sagittarii	6.4	0.79	3.5	19 23.1	4 12.8	+ 7 17.7	+0.3531	0.5636	0.1139	+46	−18
ρ	Sagittarii	4.0	+0.78	+3.1	−18 0.0	4 15.6	+ 7 20.4	−1.1022	0.5636	+0.1140	−40	−90
45	Sagittarii	6.0	0.78	3.2	18 27.5	4 19.5	+ 7 24.2	−0.6115	0.5636	0.1141	− 7	−82
266 B.	Sagittarii	6.1	0.72	3.6	19 1.9	10 46.3	−10 22.5	+0.7656	0.5637	0.1261	+71	+ 6
267 B.	Sagittarii	5.8	0.72	3.5	18 24.7	11 3.4	−10 6.1	+0.1500	0.5637	0.1266	+35	−30
16 B.	Capricorni	6.2	0.54	3.3	15 2.4	**27** 6 28.0	+ 8 38.0	−0.5741	0.5634	0.1600	0	−77
β	Capricorni	3.2	+0.54	+3.3	−15 2.2	6 34.2	+ 8 43.9	−0.5604	0.5634	+0.1601	+ 1	−76
31 B.	Capricorni	6.4	0.52	3.6	16 0.6	9 59.1	−11 58.4	+1.0019	0.5633	0.1655	+74	+21
27 G.	Capricorni	6.2	0.51	3.5	15 19.6	11 2.2	−10 57.5	+0.4708	0.5632	0.1671	+59	−12
45 B.	Capricorni	6.1	0.50	3.3	14 0.0	12 26.1	− 9 36.5	−0.6661	0.5632	0.1692	− 5	−87
τ	Capricorni	5.2	0.48	3.5	15 14.3	14 40.8	− 7 26.5	+0.9966	0.5630	0.1726	+75	+21
84 B.	Capricorni	6.0	+0.45	+3.2	−12 50.7	19 46.9	− 2 31.0	−0.5709	0.5629	+0.1799	+ 2	−76

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Lin ing al
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.
		Δα	Δδ							
		s	″	° ′	d h m	h m				°
				NEW	*MOON.*					
136 B. Piscium	6.5	+0.47	+3.2	+ 8 54.8	4 1 41.4	− 0 10.5	−0.3990	0.5735	+0.2131	+17
101 Piscium	6.2	0.69	3.7	14 14.9	5 0 42.2	− 2 0.5	−1.0824	0.5807	0.1864	−26
20 H^1. Arietis	6.4	0.85	3.8	16 50.8	14 33.9	+11 20.1	−1.2361	0.5850	0.1645	−44
19 Arietis	5.8	+0.86	+3.2	+14 54.1	16 5.0	−11 12.3	+0.9516	0.5855	+0.1618	+90
27 Arietis	6.4	0.96	3.5	17 20.8	23 20.6	− 4 13.3	−0.3630	0.5875	0.1486	+18
36 Arietis	6.5	1.02	3.2	17 25.4	6 4 46.5	+ 1 0.2	+0.3404	0.5890	0.1380	+59
40 Arietis	6.0	1.05	3.3	17 56.9	6 28.3	+ 2 38.1	+0.0455	0.5894	0.1346	+41
π Arietis	5.2	1.04	3.0	17 7.7	6 47.2	+ 2 56.2	+0.9084	0.5895	0.1340	+90
45 Arietis	6.0	+1.09	+3.1	+18 0.3	9 24.2	+ 5 27.1	+0.3745	0.5900	+0.1287	+62
ρ Arietis	5.6	1.09	3.0	17 42.1	9 38.9	+ 5 41.3	+0.7102	0.5901	0.1281	+90
54 Arietis	6.5	1.15	2.9	18 29.1	14 26.0	+10 17.3	+0.5138	0.5911	0.1181	+73
δ Arietis	4.5	1.18	3.1	19 25.3	15 44.0	+11 32.3	−0.2749	0.5913	0.1153	+23
τ Arietis	5.2	1.25	3.3	20 51.4	19 33.8	− 8 46.9	−1.2926	0.5920	0.1069	−65
63 Arietis	5.2	+1.25	+3.1	+20 27.3	20 10.8	− 8 11.3	−0.8223	0.5921	+0.1056	− 9
65 Arietis	6.0	1.26	3.1	20 31.1	20 50.9	− 7 32.8	−0.8164	0.5922	0.1041	− 9
14 H^1. Tauri	6.5	1.34	2.6	20 39.2	7 2 39.3	− 1 58.0	−0.3878	0.5929	0.0910	+16
13 Tauri	5.6	1.35	2.1	19 26.5	3 59.3	− 0 41.1	+0.9533	0.5930	0.0879	+90
14 Tauri	6.2	1.36	2.0	19 24.6	4 34.2	− 0 7.5	+1.0364	0.5931	0.0866	+90
22 H^1. Tauri	6.1	+1.37	+2.5	+20 40.5	4 49.8	+ 0 7.4	−0.2168	0.5931	+0.0860	+26
A Tauri	4.5	1.50	2.1	21 51.7	12 51.3	+ 7 50.1	−0.8038	0.5935	0.0672	− 8
39 Tauri	6.1	1.51	2.1	21 47.5	13 6.5	+ 8 4.7	−0.7158	0.5935	0.0666	− 3
192 B. Tauri	6.1	1.55	2.0	22 12.4	16 5.7	+10 56.8	−0.9486	0.5935	0.0595	−19
ω Tauri	4.8	1.56	1.1	20 22.8	17 52.3	−11 20.7	+1.0049	0.5934	0.0553	+90
51 Tauri	5.6	+1.58	+1.4	+21 23.0	18 18.1	−10 55.9	+0.0120	0.5934	+0.0542	+39
53 Tauri	5.3	1.57	1.2	20 56.9	18 43.6	−10 31.4	+0.4762	0.5934	0.0532	+70
56 Tauri	5.2	1.58	1.5	21 34.8	18 47.3	−10 27.8	−0.1613	0.5934	0.0530	+29
224 B. Tauri	6.1	1.59	1.0	20 37.9	19 54.1	− 9 23.6	+0.8585	0.5933	0.0504	+90
227 B. Tauri	5.9	1.60	1.0	20 47.7	20 21.6	− 8 57.3	+0.7158	0.5933	0.0493	+90
κ Tauri	4.1	+1.63	+1.4	+22 6.6	21 4.0	− 8 16.5	−0.5858	0.5933	+0.0476	+ 5
67 Tauri	5.4	1.62	1.4	22 1.0	21 5.2	− 8 15.2	−0.4895	0.5933	0.0475	+10
υ Tauri	4.2	1.64	1.5	22 37.9	21 26.0	− 7 55.4	−1.0981	0.5933	0.0467	−32
72 Tauri	5.4	1.64	1.6	22 48.9	21 49.5	− 7 32.8	−1.2671	0.5932	0.0458	−59
247 B. Tauri	5.8	1.63	1.0	21 26.4	22 7.6	− 7 15.4	+0.1436	0.5931	0.0450	+47
129 H^1. Tauri	5.8	+1.68	+0.3	+20 31.4	8 2 13.4	− 3 19.1	+1.2415	0.5928	+0.0351	+84
τ Tauri	4.3	1.73	+0.9	22 48.2	3 46.7	− 1 49.5	−1.0278	0.5927	0.0313	−26
ι Tauri	4.7	1.83	−0.5	21 28.5	12 7.3	+ 6 11.6	+0.5032	0.5912	0.0112	+73
330 B. Tauri	6.3	1.83	0.7	21 9.9	12 38.1	+ 6 41.2	+0.8256	0.5912	0.0099	+90
105 Tauri	6.0	1.86	0.7	21 35.9	14 3.4	+ 8 3.3	+0.3945	0.5909	+0.0065	+64
108 Tauri	6.2	+1.91	−0.8	+22 11.6	17 4.6	+10 57.4	−0.2052	0.5901	−0.0007	+26
n Tauri	5.1	1.93	1.1	22 0.8	18 36.8	−11 33.9	−0.0254	0.5897	0.0044	+37
o Tauri	4.8	1.97	1.5	21 52.1	21 59.2	− 8 19.4	+0.0949	0.5888	0.0124	+44
ζ Tauri	3.0	2.01	2.3	21 5.6	9 2 3.1	− 4 24.9	+0.8215	0.5875	0.0220	+90
175 H^1. Tauri	6.5	2.06	2.0	22 37.2	3 49.5	− 2 42.6	−0.7919	0.5869	0.0262	− 8
141 Tauri	6.3	+2.16	−3.1	+22 24.0	11 51.2	+ 5 0.8	−0.8512	0.5838	−0.0446	−12
14 B. Geminorum	6.0	2.20	3.6	22 12.2	15 5.5	+ 8 7.8	−0.8059	0.5825	0.0519	− 9
η Gemin. (*var.*)	3.2	2.23	3.7	22 31.8	17 17.9	+10 15.2	−1.2654	0.5815	0.0568	−57
15 Geminorum	6.5	2.26	5.0	20 50.3	22 41.6	− 8 33.2	+0.1478	0.5790	0.0685	+47
16 Geminorum	6.2	2.26	5.1	20 32.7	22 46.1	− 8 28.9	+0.4479	0.5790	0.0686	+68
ν Geminorum	4.1	+2.26	−5.2	+20 15.8	23 11.8	− 8 4.1	+0.7103	0.5788	−0.0695	+90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

	The Star's					At Conjunction in R. A.					Limiting Parallels.	
	Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
			Δα	Δδ								
			s	″	° ′	d h m	h m				°	°
ζ	Gemin. (*var.*)	3.7	+2.43	− 7.0	+20 41.3	**10** 14 6.6	+ 6 18.0	−0.9991	0.5710	−0.0997	−22	−70
162 B.	Geminorum	5.7	2.49	9.5	17 15.4	**11** 2 14.0	− 6 0.4	+1.2477	0.5642	0.1218	+88	+55
f	Geminorum	5.3	2.53	9.7	17 51.4	5 37.5	− 2 44.0	+0.1953	0.5623	0.1275	+50	−17
g	Geminorum	5.0	2.56	9.8	18 42.4	8 35.0	+ 0 7.3	−1.0819	0.5606	0.1324	−28	−72
1	Cancri	6.0	2.57	11.2	16 0.3	13 30.4	+ 4 52.6	+1.0920	0.5578	0.1401	+90	+36
2 B.	Cancri	6.0	+2.58	−11.0	+16 44.1	14 11.4	+ 5 32.2	+0.2260	0.5574	−0.1412	+52	−17
3	Cancri	5.7	2.60	10.9	17 31.7	15 12.4	+ 6 31.1	−0.7554	0.5568	0.1427	− 4	−73
5	Cancri	5.9	2.59	11.2	16 40.6	15 32.6	+ 6 50.7	+0.0953	0.5566	0.1432	+44	−24
29	Cancri	5.9	2.65	13.0	14 28.6	**12** 4 3.5	− 5 3.6	+0.5207	0.5495	0.1605	+73	− 4
84 B.	Cancri	6.4	2.66	13.5	13 31.9	6 28.2	− 2 43.7	+1.1332	0.5482	0.1635	+90	+36
90 B.	Cancri	6.3	+2.69	−13.0	+15 35.5	7 33.5	− 1 40.6	−1.2323	0.5476	−0.1649	−42	−75
A^1	Cancri	5.5	2.68	14.0	12 58.1	10 55.8	+ 1 35.1	+0.9912	0.5458	0.1689	+90	+24
A^2	Cancri	5.7	2.68	14.3	12 24.2	12 42.4	+ 3 18.3	+1.2903	0.5448	0.1709	+86	+54
60	Cancri	5.7	2.70	14.8	11 55.9	17 0.0	+ 7 27.4	+1.0508	0.5426	0.1755	+90	+28
α	Cancri	4.3	2.71	14.8	12 10.1	18 13.4	+ 8 38.6	+0.5842	0.5420	0.1768	+78	− 1
κ	Cancri	5.1	+2.72	−15.4	+10 59.4	22 42.3	−11 1.1	+1.0389	0.5397	−0.1813	+90	+26
209 B.	Cancri	6.5	2.74	15.3	11 53.4	23 40.8	−10 4.4	−0.0994	0.5392	0.1822	+33	−40
222 B.	Cancri	6.3	2.76	15.6	11 50.2	**13** 3 37.1	− 6 15.5	−0.7670	0.5373	0.1857	− 4	−79
ω	Leonis	5.5	2.76	16.4	9 24.3	8 50.7	− 1 11.7	+0.8539	0.5349	0.1900	+90	+12
h	Leonis	5.2	2.77	16.4	10 4.1	10 34.3	+ 0 28.6	−0.1865	0.5342	0.1914	+28	−46
ο	Leonis	3.8	+2.79	−16.6	+10 15.4	15 8.6	+ 4 54.5	−1.2715	0.5322	−0.1946	−44	−80
89 B.	Leonis	6.2	2.81	17.3	8 41.8	23 40.4	−10 49.3	−1.2796	0.5289	0.1998	−45	−82
π	Leonis	4.9	2.81	17.4	8 25.7	**14** 0 44.0	− 9 47.8	−1.2034	0.5285	0.2003	−36	−82
14	Sextantis	6.3	2.81	17.9	6 0.1	4 5.3	− 6 32.4	+0.7373	0.5273	0.2020	+90	+ 3
19	Sextantis	5.9	2.81	18.2	5 0.6	7 9.6	− 3 33.6	+1.1861	0.5263	0.2033	+90	+35
155 B.	Leonis	6.5	+2.83	−18.2	+ 6 6.0	12 30.4	+ 1 37.6	−1.0846	0.5246	−0.2053	−25	−84
237 B.	Leonis	6.3	2.85	19.0	1 27.0	**15** 3 31.9	− 7 47.4	+0.8440	0.5209	0.2086	+90	+ 9
55	Leonis	6.1	2.86	19.0	1 9.8	5 20.6	− 6 1.9	+0.7770	0.5206	0.2088	+90	+ 4
p^3	Leonis	6.1	2.86	19.1	0 25.8	9 29.1	− 2 0.6	+0.7104	0.5198	0.2090	+90	0
p^5	Leonis	5.3	2.87	19.1	+ 0 22.0	14 48.5	+ 3 9.4	−0.3318	0.5189	0.2089	+20	−58
388 B.	Leonis	6.3	+2.88	−19.1	− 1 15.6	22 15.2	+10 23.2	−0.1103	0.5181	−0.2081	+32	−44
e	Leonis	5.1	2.88	19.1	2 33.7	23 31.7	+11 37.6	+1.0479	0.5180	0.2078	+88	+22
431 B.	Leonis	6.2	2.89	19.0	1 59.6	**16** 3 47.7	− 8 13.9	−0.4583	0.5177	0.2069	+13	−67
13 B.	Virginis	5.9	2.90	18.8	4 53.3	10 28.3	− 1 44.8	+1.3377	0.5174	0.2050	+81	+54
78 B.	Virginis	6.5	2.90	18.4	5 16.4	22 44.6	+10 10.2	−0.7239	0.5175	0.1999	− 2	−90
χ	Virginis	4.8	+2.91	−17.6	− 7 33.3	**17** 11 54.2	− 1 2.9	−0.7968	0.5185	−0.1922	− 8	−90
ψ	Virginis	5.0	2.91	17.0	9 6.2	19 49.2	+ 6 38.2	−0.5873	0.5195	0.1864	+ 4	−78
49	Virginis	5.2	2.91	16.4	10 18.7	**18** 2 53.0	−10 30.2	−0.5499	0.5206	0.1806	+ 5	−74
50	Virginis	6.2	2.91	16.4	9 54.1	3 51.2	− 9 33.8	−1.1785	0.5208	0.1798	−37	−90
i	Virginis	5.7	2.91	15.4	12 17.4	12 38.6	− 1 1.8	−0.0816	0.5224	0.1716	+29	−43
550 B.	Virginis	6.0	+2.91	−14.9	−12 48.2	16 44.3	+ 2 56.6	−0.2083	0.5233	−0.1675	+22	−50
621 B.	Virginis	6.4	2.88	13.2	14 35.2	**19** 7 56.2	− 6 18.7	−0.6516	0.5270	0.1504	− 4	−87
214 G.	Virginis	6.5	2.90	12.9	15 57.1	8 19.1	− 5 56.5	+0.8059	0.5271	0.1499	+74	+ 7
40 H.	Virginis	5.1	2.89	12.6	15 55.4	11 9.4	− 3 11.4	+0.3535	0.5279	0.1465	+51	−19
ι	Libræ	4.7	2.78	8.3	19 29.3	**20** 17 34.8	+ 2 18.0	+0.4846	0.5366	0.1033	+55	−11
25	Libræ	6.0	+2.78	− 8.3	−19 20.7	18 7.0	+ 2 49.2	+0.2707	0.5368	−0.1025	+41	−23
147 B.	Libræ	6.2	2.74	7.0	20 27.2	**21** 2 28.8	+10 55.0	+0.6963	0.5392	0.0890	+69	+ 2
150 B.	Libræ	6.1	2.72	7.0	19 53.4	3 1.8	+11 27.0	+0.0248	0.5394	0.0881	+25	−37
11 H.	Libræ	5.4	2.71	7.1	19 23.8	3 27.8	+11 52.2	−0.5597	0.5395	0.0874	− 6	−77
172 B.	Libræ	5.9	2.72	6.4	20 45.0	6 9.8	− 9 31.1	+0.7098	0.5403	0.0829	+69	+ 2
41	Libræ	5.3	+2.69	− 6.9	−19 2.3	6 29.6	− 9 11.8	−1.2149	0.5404	−0.0823	−54	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S						AT CONJUNCTION IN R. A.					Limiting Parallels.	
	Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
			Δα	Δδ								
			s	"	° ′	d h m	h m				°	°
κ	Libræ	5.0	+2.68	-6.6	-19 25.1	21 7 57.0	- 7 47.2	-0.9107	0.5408	-0.0798	-28	-90
λ	Libræ	5.1	2.65	5.7	19 55.7	13 23.2	- 2 31.5	-0.7554	0.5423	0.0705	-19	-90
10 G.	Scorpii	5.9	2.64	5.2	20 45.0	15 26.5	- 0 32.2	+0.0138	0.5429	0.0669	+23	-37
ω^1	Scorpii	4.3	2.60	4.8	20 27.1	19 46.8	+ 3 39.7	-0.5892	0.5440	0.0592	-11	-81
ω^2	Scorpii	4.6	2.60	4.7	20 39.1	20 3.5	+ 3 55.9	-0.3844	0.5441	0.0587	0	-63
84 B.	Scorpii	6.3	+2.58	-4.2	-20 54.2	23 24.0	+ 7 9.8	-0.2925	0.5449	-0.0527	+ 5	-56
51 G.	Scorpii	6.5	2.57	4.0	21 6.3	22 0 34.5	+ 8 18.2	-0.1315	0.5452	0.0505	+13	-46
ω	Ophiuchi	4.5	2.51	2.9	21 17.7	7 41.3	- 8 49.0	-0.2341	0.5470	0.0374	+ 7	-52
116 B.	Ophiuchi	6.3	2.34	0.9	21 27.2	23 31.6	+ 6 29.9	-0.4138	0.5504	-0.0074	- 6	-65
ξ	Ophiuchi	4.4	2.27	-0.3	21 1.6	23 6 21.2	-10 54.4	-0.8849	0.5515	+0.0059	-34	-90
190 B.	Ophiuchi	5.9	+2.25	+0.1	-21 22.0	8 3.5	- 9 15.4	-0.4991	0.5518	+0.0092	-11	-72
52	Ophiuchi	6.4	2.20	0.9	21 59.4	12 55.1	- 4 33.6	+0.2492	0.5525	0.0187	+31	-24
58	Ophiuchi	4.8	2.15	1.2	21 38.7	16 38.9	- 0 57.3	-0.0440	0.5530	0.0260	+15	-41
16 G.	Sagittarii	6.4	2.04	1.6	20 20.0	24 0 14.3	+ 6 22.7	-1.2142	0.5539	0.0409	-58	-90
30 G.	Sagittarii	6.2	2.02	2.3	21 27.2	3 29.9	+ 9 31.7	+0.1445	0.5542	0.0472	+28	-30
μ	Sagittarii	4.0	+1.98	+2.5	-21 4.8	6 29.9	-11 34.4	-0.1082	0.5545	+0.0531	+14	-44
14	Sagittarii	5.6	1.98	2.8	21 44.1	6 43.0	-11 21.7	+0.6122	0.5545	0.0535	+59	- 3
15	Sagittarii	5.3	1.96	2.5	20 45.2	7 9.9	-10 55.7	-0.4274	0.5546	0.0544	- 3	-66
16	Sagittarii	5.9	1.96	2.4	20 24.8	7 10.3	-10 55.3	-0.7953	0.5546	0.0544	-24	-90
21	Sagittarii	5.0	1.90	2.9	20 35.1	11 46.7	- 6 28.4	-0.3359	0.5549	0.0633	+ 3	-59
115 B.	Sagittarii	5.7	+1.84	+3.7	-21 27.9	17 28.3	- 0 58.3	+1.0039	0.5552	+0.0743	+69	+23
121 B.	Sagittarii	5.9	1.83	3.6	21 7.1	17 55.7	- 0 31.9	+0.6648	0.5553	0.0752	+65	0
128 B.	Sagittarii	6.3	1.80	3.9	21 5.0	20 50.4	+ 2 16.9	+0.8530	0.5554	0.0807	+69	+12
29	Sagittarii	5.3	1.76	3.9	20 25.0	22 49.8	+ 4 12.3	+0.3000	0.5554	0.0845	+40	-21
36	Sagittarii	5.1	1.72	4.3	20 45.7	25 2 18.5	+ 7 33.9	+0.9742	0.5556	0.0910	+70	+20
171 B.	Sagittarii	6.1	+1.67	+4.1	-19 21.8	4 55.6	+10 5.7	-0.2802	0.5557	+0.0958	+10	-55
173 B.	Sagittarii	6.4	1.67	4.0	19 13.2	4 57.2	+10 7.2	-0.4308	0.5557	0.0959	0	-66
187 B.	Sagittarii	6.4	1.65	4.0	18 51.8	6 47.1	+11 53.4	-0.6332	0.5558	0.0993	- 9	-85
190 B.	Sagittarii	5.4	1.64	4.3	19 25.0	7 17.5	-11 37.2	+0.0098	0.5558	0.1002	+25	-37
195 B.	Sagittarii	6.3	1.64	4.5	19 55.9	7 58.5	-10 57.7	+0.6276	0.5558	0.1015	+65	- 3
d	Sagittarii	5.0	+1.59	+4.5	-19 5.8	11 32.6	- 7 30.9	+0.1105	0.5559	+0.1080	+32	-32
226 B.	Sagittarii	6.4	1.57	4.8	19 23.1	13 20.7	- 5 46.4	+0.6150	0.5559	0.1112	+65	- 4
ρ	Sagittarii	4.0	1.55	4.3	18 0.0	13 23.5	- 5 43.7	-0.8554	0.5559	0.1113	-22	-90
45	Sagittarii	6.0	1.56	4.4	18 27.5	13 27.5	- 5 39.9	-0.3597	0.5559	0.1114	+ 7	-61
266 B.	Sagittarii	6.1	1.48	5.2	19 1.9	20 4.3	+ 0 43.5	+1.0237	0.5559	0.1231	+71	+24
267 B.	Sagittarii	5.8	+1.47	+5.0	-18 24.6	20 21.8	+ 1 0.3	+0.4014	0.5560	+0.1236	+51	-16
g	Sagittarii	5.1	1.33	4.7	15 42.4	26 5 53.0	+10 12.1	-1.2006	0.5560	0.1397	-46	-90
16 B.	Capricorni	6.2	1.20	5.1	15 2.4	16 15.3	- 3 46.7	-0.3588	0.5561	0.1562	+12	-60
β	Capricorni	3.2	1.20	5.1	15 2.2	16 21.7	- 3 40.6	-0.3453	0.5561	0.1564	+12	-59
31 B.	Capricorni	6.4	1.17	5.6	16 0.5	19 51.3	- 0 18.1	+1.2253	0.5561	0.1617	+74	+42
27 G.	Capricorni	6.2	+1.15	+5.4	-15 19.6	20 55.8	+ 0 44.1	+0.6876	0.5562	+0.1633	+74	0
45 B.	Capricorni	6.1	1.13	5.1	13 59.9	22 21.6	+ 2 7.1	-0.4618	0.5562	0.1653	+ 7	-68
τ	Capricorni	5.2	1.11	5.5	15 14.3	27 0 39.3	+ 4 20.1	+1.2111	0.5562	0.1687	+75	+39
84 B.	Capricorni	6.0	1.05	5.0	12 50.6	5 51.9	+ 9 22.1	-0.3795	0.5564	0.1759	+13	-61
16 B.	Aquarii	6.4	1.03	4.8	11 52.7	6 58.0	+10 25.9	-1.1844	0.5564	0.1774	-40	-90
ν	Aquarii	4.5	+0.96	+5.0	-11 41.9	14 27.4	- 6 19.9	-0.0026	0.5568	+0.1869	+34	-38
51 G.	Aqaurii	6.5	0.93	4.9	10 56.4	16 35.5	- 4 16.2	-0.3822	0.5569	0.1895	+14	-62
17	Aquarii	6.3	0.89	4.7	9 39.8	20 32.0	- 0 27.8	-0.9359	0.5572	0.1941	-18	-90
19	Aquarii	5.6	0.88	4.8	10 5.6	21 33.6	+ 0 31.7	-0.2955	0.5573	0.1953	+19	-56
ξ	Aquarii	4.8	0.83	4.5	8 13.0	28 3 14.9	+ 6 1.3	-1.0854	0.5578	0.2013	-28	-90
c^1	Capricorni	5.3	+0.80	+4.9	- 9 27.2	6 31.3	+ 9 11.1	+0.8417	0.5582	+0.2045	+81	+ 9

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
c^2 Capricorni	6.3	+0.79	+5.0	− 9 38.9	28 7 5.6	+ 9 44.2	+1.1574	0.5583	+0.2050	+81	+32
30 Aquarii	5.6	0.73	4.5	6 54.8	14 47.1	− 6 50.1	−0.0236	0.5593	0.2118	+35	−39
138 B. Aquarii	6.4	0.69	4.1	5 7.2	19 3.4	− 2 42.6	−0.9274	0.5599	0.2150	−15	−90
44 Aquarii	5.7	0.68	4.3	5 47.5	21 1.0	− 0 49.0	+0.1747	0.5602	0.2164	+47	−29
51 Aquarii	5.8	0.66	4.2	5 14.8	29 0 9.7	+ 2 13.2	+0.3081	0.5608	0.2183	+55	−22
187 B. Aquarii	6.3	+0.64	+3.9	− 3 19.5	3 23.6	+ 5 20.5	−0.9180	0.5615	+0.2203	−14	−90
κ Aquarii	5.2	0.62	4.1	4 38.7	6 16.3	+ 8 7.1	+1.0451	0.5621	0.2217	+86	+22
207 B. Aquarii	6.3	+0.61	+4.0	− 3 58.5	7 37.8	+ 9 25.8	+0.6727	0.5624	+0.2223	+84	− 2
				NEW	*MOON.*						

APRIL.

Name.	Mag.	$\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
36 Arietis	6.5	+0.74	+1.6	+17 25.3	2 13 26.0	+11 27.5	+0.1614	0.6004	+0.1389	+48	−19
40 Arietis	6.0	0.76	1.6	17 56.9	15 4.3	−10 58.1	−0.1316	0.6009	0.1355	+31	−35
π Arietis	5.2	+0.76	+1.4	+17 7.7	15 22.6	−10 40.6	+0.7169	0.6010	+0.1348	+90	+12
45 Arietis	6.0	0.78	1.5	18 0.3	17 54.2	− 8 15.1	+0.1873	0.6016	0.1294	+49	−17
ρ Arietis	5.6	0.79	1.4	17 42.1	18 8.4	− 8 1.4	+0.5172	0.6017	0.1289	+73	+ 1
53 Arietis	6.0	0.82	1.1	17 34.1	22 25.0	− 3 55.1	+1.1809	0.6027	0.1196	+90	+48
54 Arietis	6.5	0.83	1.3	18 29.1	22 45.8	− 3 35.2	+0.3166	0.6027	0.1188	+58	− 9
δ Arietis	4.5	+0.85	+1.4	+19 25.3	3 0 1.1	− 2 22.8	−0.4611	0.6030	+0.1160	+12	−53
63 Arietis	5.2	0.90	1.4	20 27.2	4 18.7	+ 1 44.4	−1.0058	0.6037	0.1061	−23	−70
65 Arietis	6.0	0.90	1.4	20 31.0	4 57.4	+ 2 21.6	−1.0008	0.6038	0.1047	−22	−70
175 B. Arietis	6.4	0.90	0.8	18 28.4	5 59.2	+ 3 20.9	+1.1287	0.6040	0.1022	+90	+44
14 H^1. Tauri	6.5	0.96	1.0	20 39.2	10 33.9	+ 7 44.4	−0.5870	0.6044	0.0914	+ 5	−60
13 Tauri	5.6	+0.97	+0.6	+19 26.5	11 51.2	+ 8 58.5	+0.7305	0.6045	+0.0883	+90	+17
14 Tauri	6.2	0.97	0.6	19 24.6	12 25.0	+ 9 30.9	+0.8114	0.6045	0.0870	+90	+22
22 H^1. Tauri	6.1	0.98	0.9	20 40.4	12 40.0	+ 9 45.4	−0.4214	0.6046	0.0864	+14	−48
A Tauri	4.5	1.08	0.6	21 51.7	20 25.4	− 6 48.0	−1.0082	0.6047	0.0674	−24	−69
39 Tauri	6.1	1.09	0.6	21 47.5	20 40.1	− 6 34.0	−0.9218	0.6046	0.0667	−17	−69
192 B. Tauri	6.1	+1.12	+0.5	+22 12.4	23 33.5	− 3 47.6	−1.1541	0.6045	+0.0596	−38	−68
ω Tauri	4.8	1.12	−0.2	20 22.8	4 1 16.6	− 2 8.7	+0.7663	0.6043	0.0552	+90	+22
51 Tauri	5.6	1.14	+0.1	21 22.9	1 41.5	− 1 44.8	−0.2111	0.6042	0.0542	+26	−32
53 Tauri	5.3	1.14	−0.1	20 56.8	2 6.2	− 1 21.2	+0.2452	0.6042	0.0532	+53	− 7
56 Tauri	5.2	1.14	+0.1	21 34.7	2 9.8	− 1 17.7	−0.3822	0.6042	0.0530	+16	−42
224 B. Tauri	6.1	+1.15	−0.2	+20 37.9	3 14.5	− 0 15.6	+0.6204	0.6041	+0.0503	+85	+14
227 B. Tauri	5.9	1.15	−0.2	20 47.7	3 41.1	+ 0 9.9	+0.4795	0.6040	0.0492	+70	+ 6
κ Tauri	4.1	1.18	+0.1	22 6.6	4 22.2	+ 0 49.3	−0.8022	0.6039	0.0475	− 9	−68
67 Tauri	5.4	1.18	+0.1	22 1.0	4 23.4	+ 0 50.5	−0.7074	0.6039	0.0475	− 3	−67
247 B. Tauri	5.8	1.18	−0.2	21 26.4	5 23.8	+ 1 48.5	−0.0853	0.6038	0.0449	+33	−24
129 H^1. Tauri	5.8	+1.22	−0.8	+20 31.4	9 22.0	+ 5 37.0	+0.9921	0.6031	+0.0349	+90	+39
τ Tauri	4.3	1.26	0.2	22 48.2	10 52.4	+ 7 3.8	−1.2434	0.6028	0.0311	−52	−68
ι Tauri	4.7	1.35	1.4	21 28.5	18 58.2	− 9 10.0	+0.2582	0.6007	0.0108	+54	− 2
330 B. Tauri	6.3	1.35	1.5	21 9.9	19 28.1	− 8 41.3	+0.5756	0.6005	0.0095	+80	+15
105 Tauri	6.0	1.37	1.5	21 35.9	20 51.1	− 7 21.4	+0.1499	0.6001	+0.0061	+47	− 8
108 Tauri	6.2	+1.41	−1.6	+22 11.6	23 47.2	− 4 32.5	−0.4430	0.5990	−0.0012	+13	−42
n Tauri	5.1	1.43	1.8	22 0.8	5 1 16.9	− 3 6.3	−0.2667	0.5985	0.0049	+23	−31
ο Tauri	4.8	1.47	2.2	21 52.1	4 34.0	+ 0 3.0	−0.1498	0.5971	0.0130	+29	−25
ζ Tauri	3.0	1.51	2.8	21 5.6	8 31.7	+ 3 51.3	+0.5654	0.5954	0.0225	+79	+13
175 H^1. Tauri	6.5	1.55	2.5	22 37.2	10 15.5	+ 5 31.0	−1.0277	0.5946	0.0268	−26	−68
χ^1 Orionis	4.5	+1.58	−3.8	+20 15.7	15 12.5	+10 16.4	+1.2104	0.5921	−0.0385	+90	+58

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's						At Conjunction in R. A.					Limiting Parallels.	
	Name.	Mag.	Red'ns from 1919.0. Δα	Red'ns from 1919.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
			s	″	°	d h m	h m				°	°
141	Tauri	6.3	+1.64	− 3.3	+22 24.0	5 18 6.2	−10 56.6	−1.0898	0.5906	−0.0452	−31	−68
χ^2	Orionis	4.7	1.63	4.2	20 8.4	19 2.0	−10 3.0	+1.1722	0.5901	0.0473	+90	+53
14 B.	Geminorum	6.0	1.68	3.8	22 12.2	21 16.4	− 7 53.8	−1.0461	0.5888	0.0524	−27	−68
15	Geminorum	6.5	1.75	5.0	20 50.3	6 4 43.8	− 0 43.6	−0.1042	0.5844	0.0689	+32	−27
16	Geminorum	6.2	1.75	5.1	20 32.7	4 48.1	− 0 39.4	+0.1928	0.5843	0.0691	+50	−11
ν	Geminorum	4.1	+1.75	− 5.2	+20 15.8	5 13.4	− 0 15.0	+0.4524	0.5841	−0.0700	+68	+ 3
ζ	Gemin. (*var.*)	3.7	1.93	6.6	20 41.3	19 54.6	−10 6.5	−1.2406	0.5745	0.0998	−48	−70
162 B.	Geminorum	5.7	2.02	9.0	17 15.4	7 7 54.4	+ 1 27.3	+0.9943	0.5662	0.1215	+90	+30
f	Geminorum	5.3	2.07	9.1	17 51.5	11 16.3	+ 4 42.2	−0.0499	0.5640	0.1271	+35	−30
1	Cancri	6.0	2.13	10.5	16 0.3	19 6.4	−11 44.1	+0.8474	0.5585	0.1393	+90	+18
2 B.	Cancri	6.0	+2.14	−10.3	+16 44.1	19 47.3	−11 4.6	−0.0142	0.5580	−0.1404	+37	−30
3	Cancri	5.7	2.16	10.1	17 31.7	20 48.0	−10 6.0	−0.9907	0.5574	0.1419	−20	−73
5	Cancri	5.9	2.16	10.4	16 40.6	21 8.1	− 9 46.5	−0.1434	0.5571	0.1424	+30	−37
30 B.	Cancri	6.1	2.18	11.4	14 52.0	8 1 28.2	− 5 35.3	+1.1309	0.5543	0.1485	+90	+38
29	Cancri	5.9	2.26	12.3	14 28.6	9 37.3	+ 2 17.6	+0.2913	0.5489	0.1591	+55	−15
84 B.	Cancri	6.4	+2.27	−12.8	+13 31.9	12 2.0	+ 4 37.5	+0.9049	0.5473	−0.1621	+90	+19
A^1	Cancri	5.5	2.30	13.3	12 58.1	16 29.9	+ 8 56.6	+0.7682	0.5446	0.1672	+90	+10
A^2	Cancri	5.7	2.32	13.6	12 24.3	18 16.6	+10 39.9	+1.0690	0.5435	0.1691	+90	+30
60	Cancri	5.7	2.35	14.1	11 55.9	22 34.9	− 9 10.1	+0.8351	0.5409	0.1736	+90	+13
α	Cancri	4.3	2.36	14.1	12 10.1	23 48.5	− 7 58.9	+0.3705	0.5402	0.1748	+61	−14
κ	Cancri	5.1	+2.39	−14.8	+10 59.4	9 4 18.4	− 3 37.6	+0.8309	0.5377	−0.1791	+90	+12
209 B.	Cancri	6.5	2.41	14.5	11 53.5	5 17.2	− 2 40.6	−0.3057	0.5372	0.1800	+21	−51
222 B.	Cancri	6.3	2.44	14.8	11 50.2	9 14.6	+ 1 9.3	−0.9683	0.5351	0.1834	−18	−79
ω	Leonis	5.5	2.46	15.8	9 24.3	14 29.9	+ 6 14.8	+0.6607	0.5325	0.1875	+86	+ 1
h	Leonis	5.2	2.48	15.7	10 4.2	16 14.2	+ 7 55.9	−0.3780	0.5316	0.1888	+17	−57
14	Sextantis	6.3	+2.59	−17.7	+ 6 0.1	10 9 52.8	+ 1 2.5	+0.5757	0.5243	−0.1990	+76	− 6
19	Sextantis	5.9	2.61	18.1	5 0.6	12 58.7	+ 4 2.9	+1.0311	0.5233	0.2003	+90	+22
155 B.	Leonis	6.5	2.65	18.0	6 6.0	18 22.2	+ 9 16.8	−1.2354	0.5216	0.2022	−39	−84
237 B.	Leonis	6.3	2.74	19.3	1 27.0	11 9 31.7	− 0 0.2	+0.7276	0.5180	0.2054	+90	+ 2
55	Leonis	6.1	2.75	19.4	1 9.8	11 21.3	+ 1 46.2	+0.6640	0.5177	0.2056	+85	− 2
p^3	Leonis	6.1	+2.77	−19.5	+ 0 25.8	15 32.0	+ 5 49.7	+0.6056	0.5170	−0.2058	+79	− 5
p^5	Leonis	5.3	2.80	19.5	+ 0 22.0	20 54.2	+11 2.5	−0.4289	0.5163	0.2057	+15	−64
388 B.	Leonis	6.3	2.85	19.8	− 1 15.6	12 4 24.4	− 5 40.1	−0.1911	0.5157	0.2050	+28	−49
e	Leonis	5.1	2.86	20.0	2 33.7	5 41.6	− 4 25.1	+0.9737	0.5157	0.2048	+88	+17
431 B.	Leonis	6.2	2.88	19.8	1 59.6	9 59.6	− 0 14.5	−0.5285	0.5155	0.2039	+ 9	−72
13 B.	Virginis	5.9	+2.93	−20.1	− 4 53.3	16 43.0	+ 6 17.4	+1.2876	0.5155	−0.2021	+86	+45
78 B.	Virginis	6.5	2.99	19.6	5 16.4	13 5 3.8	− 5 43.1	−0.7541	0.5162	0.1972	− 4	−90
χ	Virginis	4.8	3.06	19.2	7 33.3	18 17.2	+ 7 7.6	−0.7989	0.5178	0.1898	− 8	−90
ψ	Virginis	5.0	3.11	18.8	9 6.3	14 2 13.7	− 9 9.7	−0.5722	0.5192	0.1843	+ 4	−76
49	Virginis	5.2	3.14	18.3	10 18.8	9 18.6	− 2 17.2	−0.5203	0.5207	0.1787	+ 7	−72
50	Virginis	6.2	+3.14	−18.2	− 9 54.2	10 17.0	− 1 20.5	−1.1482	0.5209	−0.1778	−35	−90
i	Virginis	5.7	3.19	17.4	12 17.5	19 5.1	+ 7 12.1	−0.0315	0.5230	0.1699	+32	−40
550 B.	Virginis	6.0	3.21	17.0	12 48.2	23 11.0	+11 10.8	−0.1506	0.5241	0.1658	+25	−47
621 B.	Virginis	6.4	3.26	15.4	14 35.2	15 14 23.0	+ 1 55.7	−0.5667	0.5284	0.1490	0	−77
214 G.	Virginis	6.5	3.29	15.3	15 57.2	14 45.9	+ 2 17.8	+0.8939	0.5285	0.1485	+75	+13
40 H.	Virginis	5.1	+3.29	−15.0	−15 55.4	17 36.1	+ 5 2.9	+0.4456	0.5293	−0.1450	+57	−13
ι	Libræ	4.7	3.35	10.5	19 29.3	16 23 59.6	+10 30.1	+0.6245	0.5384	0.1022	+65	− 3
25	Libræ	6.0	3.34	10.4	19 20.8	17 0 31.8	+11 1.4	+0.4110	0.5386	0.1014	+50	−15
147 B.	Libræ	6.2	3.35	9.0	20 27.2	8 53.3	− 4 52.9	+0.8487	0.5410	0.0879	+70	+12
150 B.	Libræ	6.1	3.34	9.0	19 53.5	9 26.3	− 4 21.0	+0.1764	0.5411	0.0870	+34	−28
11 H.	Libræ	5.4	+3.32	− 9.0	−19 23.9	9 52.3	− 3 55.8	−0.4089	0.5412	−0.0863	+ 2	−64

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
172 B. Libræ	5.9	+3.35	−8.4	−20 45.1	**17** 12 34.2	− 1 19.0	+0.8668	0.5420	−0.0818	+70	+13
41 Libræ	5.3	3.31	8.6	19 2.3	12 54.1	− 0 59.8	−1.0618	0.5420	0.0812	−39	−90
κ Libræ	5.0	3.31	8.3	19 25.2	14 21.6	+ 0 25.0	−0.7553	0.5424	0.0788	−19	−90
λ Libræ	5.1	3.30	7.4	19 55.7	19 47.9	+ 5 40.8	−0.5934	0.5438	0.0694	−10	−81
10 G. Scorpii	5.9	3.31	6.9	20 45.1	21 51.4	+ 7 40.3	+0.1802	0.5443	0.0658	+32	−28
ω¹ Scorpii	4.3	+3.28	−6.2	−20 27.2	**18** 2 12.0	+11 52.5	−0.4199	0.5452	−0.0582	− 2	−66
ω² Scorpii	4.6	3.29	6.2	20 39.2	2 28.7	−11 51.4	−0.2142	0.5453	0.0577	+ 9	−51
84 B. Scorpii	6.3	3.28	5.6	20 54.3	5 49.7	− 8 36.9	−0.1185	0.5460	0.0516	+14	−45
51 G. Scorpii	6.5	3.28	5.3	21 6.3	7 0.3	− 7 28.7	+0.0441	0.5463	0.0495	+22	−35
58 G. Scorpii	6.2	3.24	5.4	20 1.4	8 2.1	− 6 28.8	−1.2044	0.5465	0.0477	−57	−90
ω Ophiuchi	4.5	+3.24	−4.1	−21 17.7	14 8.5	− 0 34.4	−0.0520	0.5476	−0.0364	+16	−41
116 B. Ophiuchi	6.3	3.12	1.5	21 27.2	**19** 6 3.8	− 9 10.5	−0.2197	0.5499	−0.0065	+ 4	−51
ξ Ophiuchi	4.4	3.07	0.5	21 1.6	12 56.6	− 2 31.4	−0.6889	0.5506	+0.0066	−22	−90
190 B. Ophiuchi	5.9	3.05	−0.1	21 22.0	14 39.9	− 0 51.5	−0.3001	0.5507	0.0099	0	−57
52 Ophiuchi	6.4	3.02	+0.9	21 59.4	19 34.2	+ 3 53.1	+0.4557	0.5510	0.0193	+45	−12
58 Ophiuchi	4.8	+2.98	+1.3	−21 38.7	23 20.5	+ 7 31.8	+0.1626	0.5512	+0.0265	+27	−29
16 G. Sagittarii	6.4	2.87	2.1	20 20.0	**20** 7 1.5	− 9 2.4	−1.0126	0.5514	0.0412	−40	−90
30 G. Sagittarii	6.2	2.86	3.0	21 27.1	10 19.8	− 5 50.8	+0.3576	0.5514	0.0474	+41	−18
μ Sagittarii	4.0	2.82	3.3	21 4.8	13 22.5	− 2 54.2	+0.1039	0.5514	0.0532	+26	−32
14 Sagittarii	5.6	2.83	3.5	21 44.1	13 35.8	− 2 41.3	+0.8304	0.5514	0.0536	+69	+11
15 Sagittarii	5.3	+2.80	+3.3	−20 45.1	14 3.1	− 2 14.9	−0.2176	0.5514	+0.0544	+ 9	−51
16 Sagittarii	5.9	2.80	3.2	20 24.7	14 3.5	− 2 14.5	−0.5885	0.5514	0.0545	−12	−81
21 Sagittarii	5.0	2.75	3.9	20 35.1	18 44.4	+ 2 17.0	−0.1241	0.5513	0.0632	+15	−45
115 B. Sagittarii	5.7	2.70	5.0	21 27.9	**21** 0 31.9	+ 7 52.9	+1.2293	0.5511	0.0739	+69	+48
121 B. Sagittarii	5.9	2.68	4.9	21 7.1	0 59.8	+ 8 19.9	+0.8872	0.5511	0.0748	+69	+15
128 B. Sagittarii	6.3	+2.65	+5.3	−21 5.0	3 57.8	+11 11.9	+1.0778	0.5509	+0.0802	+69	+30
29 Sagittarii	5.3	2.62	5.4	20 25.0	5 59.5	−10 50.4	+0.5199	0.5508	0.0839	+55	−10
36 Sagittarii	5.1	2.58	6.0	20 45.7	9 32.4	− 7 24.6	+1.2015	0.5506	0.0902	+70	+43
171 B. Sagittarii	6.1	2.52	5.8	19 21.7	12 12.8	− 4 49.5	−0.0657	0.5504	0.0950	+21	−42
173 B. Sagittarii	6.4	2.52	5.8	19 13.2	12 14.4	− 4 48.0	−0.2179	0.5504	0.0950	+13	−51
187 B. Sagittarii	6.4	+2.49	+5.8	−18 51.7	14 6.7	− 2 59.4	−0.4223	0.5503	+0.0983	+ 2	−65
190 B. Sagittarii	5.4	2.49	6.1	19 25.0	14 37.8	− 2 29.4	+0.2274	0.5503	0.0992	+38	−25
195 B. Sagittarii	6.3	2.49	6.3	19 55.8	15 19.7	− 1 48.9	+0.8518	0.5502	0.1004	+71	+12
d Sagittarii	5.0	2.44	6.5	19 5.8	18 58.6	+ 1 42.7	+0.3291	0.5500	0.1068	+45	−20
226 B. Sagittarii	6.4	2.41	6.8	19 23.1	20 49.2	+ 3 29.7	+0.8392	0.5499	0.1099	+71	+11
ρ Sagittarii	4.0	+2.39	+6.4	−17 59.9	20 52.1	+ 3 32.5	−0.6478	0.5499	+0.1100	− 9	−87
45 Sagittarii	6.0	2.40	6.5	18 27.5	20 56.2	+ 3 36.4	−0.1465	0.5499	0.1101	+18	−47
266 B. Sagittarii	6.1	2.32	7.4	19 1.8	**22** 3 42.6	+10 9.4	+1.2521	0.5494	0.1214	+71	+49
267 B. Sagittarii	5.8	2.31	7.3	18 24.6	4 0.6	+10 26.9	+0.6224	0.5494	0.1219	+66	− 3
54 Sagittarii	5.4	2.26	6.8	16 28.7	5 44.5	−11 52.7	−1.2350	0.5492	0.1248	−52	−90
g Sagittarii	5.1	+2.15	+7.3	−15 42.3	13 46.8	− 4 6.3	−1.0020	0.5486	+0.1375	−29	−90
16 B. Capricorni	6.2	2.00	8.0	15 2.3	**23** 0 26.5	+ 6 12.2	−0.1545	0.5481	0.1534	+22	−47
β Capricorni	3.2	2.00	8.0	15 2.2	0 33.1	+ 6 18.6	−0.1409	0.5481	0.1536	+23	−46
27 G. Capricorni	6.2	1.94	8.4	15 19.6	5 15.2	+10 51.4	+0.9032	0.5479	0.1602	+75	+14
45 B. Capricorni	6.1	1.92	8.1	13 59.9	6 43.6	−11 43.1	−0.2626	0.5479	0.1622	+18	−53
84 B. Capricorni	6.0	+1.81	+8.2	−12 50.6	14 27.5	− 4 14.5	−0.1846	0.5478	+0.1724	+24	−49
16 B. Aquarii	6.4	1.79	8.0	11 52.7	15 35.6	− 3 8.6	−1.0015	0.5478	0.1738	−24	−90
ν Aquarii	4.5	1.70	8.4	11 41.9	23 18.8	+ 4 19.3	+0.1901	0.5479	0.1831	+45	−27
51 G. Aquarii	6.5	1.66	8.2	10 56.3	**24** 1 30.9	+ 6 27.1	−0.1968	0.5480	0.1856	+24	−49
17 Aquarii	6.3	1.60	8.0	9 39.8	5 34.6	+10 22.8	−0.7620	0.5483	0.1900	− 7	−90
19 Aquarii	5.6	+1.59	+8.1	−10 5.5	6 38.2	+11 24.3	−0.1138	0.5483	+0.1911	+29	−44

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ξ Aquarii	4.8	+1.52	+ 7.8	− 8 13.0	**24** 12 30.0	− 6 55.5	−0.9208	0.5488	+0.1970	−16	−90
c^1 Capricorni	5.3	1.48	8.3	9 27.2	15 52.4	− 3 39.8	+1.0285	0.5492	0.2001	+81	+21
c^2 Capricorni	6.3	1.47	8.4	9 38.9	16 27.7	− 3 5.7	+1.3478	0.5493	0.2006	+74	+61
30 Aquarii	5.6	1.38	7.7	6 54.7	**25** 0 23.0	+ 4 33.9	+0.1410	0.5505	0.2072	+45	−30
138 B. Aquarii	6.4	1.32	7.3	5 7.1	4 46.8	+ 8 48.9	−0.7804	0.5514	0.2104	− 6	−90
44 Aquarii	5.7	+1.30	+ 7.5	− 5 47.4	6 47.8	+10 45.8	+0.3330	0.5518	+0.2117	+57	−20
51 Aquarii	5.8	1.27	7.4	5 14.7	10 1.8	−10 6.7	+0.4633	0.5524	0.2137	+66	−13
187 B. Aquarii	6.3	1.23	6.9	3 19.5	13 21.0	− 6 54.1	−0.7826	0.5533	0.2156	− 5	−90
κ Aquarii	5.2	1.20	7.3	4 38.7	16 18.2	− 4 2.8	+1.1993	0.5540	0.2171	+86	+35
207 B. Aquarii	6.3	1.19	7.1	3 58.4	17 41.9	− 2 42.0	+0.8202	0.5545	0.2177	+87	+ 7
3 Piscium	6.3	+1.10	+ 6.1	− 0 14.9	**26** 2 44.4	+ 6 2.2	−0.9685	0.5574	+0.2209	−17	−90
22 B. Piscium	6.4	1.01	6.1	− 0 9.1	13 2.5	− 8 1.1	+1.2208	0.5613	0.2226	+90	+38
κ Piscium	4.9	1.00	5.8	+ 0 48.8	14 33.7	− 6 33.0	+0.5899	0.5619	0.2226	+77	− 6
9 Piscium	6.4	1.00	5.8	0 40.8	14 42.1	− 6 24.9	+0.7561	0.5620	0.2226	+90	+ 3
16 Piscium	5.7	0.97	5.6	1 39.2	18 46.3	− 2 29.2	+0.6840	0.5638	0.2225	+87	0
19 Piscium	5.4	+0.94	+ 5.2	+ 3 2.3	23 11.2	+ 1 46.4	+0.2806	0.5659	+0.2219	+54	−22
d Piscium	5.4	+0.85	+ 4.0	+ 7 44.5	**27** 14 2.0	− 7 54.4	−1.1303	0.5736	+0.2163	−29	−83
				NEW	*MOON.*						

MAY.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
129 H^1. Tauri	5.8	+0.98	− 1.7	+20 31.4	**1** 18 55.9	− 7 1.0	+0.8689	0.6137	+0.0344	+90	+31
ι Tauri	4.7	1.06	2.3	21 28.5	**2** 4 14.1	+ 1 53.9	+0.1349	0.6117	0.0099	+46	− 9
330 B. Tauri	6.3	1.06	2.4	21 9.9	4 43.0	+ 2 21.6	+0.4470	0.6115	0.0087	+68	+ 8
105 Tauri	6.0	+1.07	− 2.4	+21 35.9	6 3.3	+ 3 38.6	+0.0264	0.6111	+0.0052	+39	−14
108 Tauri	6.2	1.10	2.5	22 11.6	8 53.7	+ 6 22.0	−0.5603	0.6101	−0.0022	+ 6	−51
n Tauri	5.1	1.11	2.7	22 0.8	10 20.6	+ 7 45.2	−0.3882	0.6096	0.0059	+16	−39
o Tauri	4.8	1.14	3.0	21 52.1	13 31.2	+10 48.0	−0.2761	0.6083	0.0141	+22	−32
372 B. Tauri	6.1	1.15	3.5	20 25.0	15 49.9	−10 59.0	+1.1319	0.6073	0.0200	+90	+52
ζ Tauri	3.0	+1.16	− 3.5	+21 5.6	17 21.0	− 9 31.5	+0.4242	0.6066	−0.0239	+66	+ 6
175 H^1. Tauri	6.5	1.20	3.2	22 37.2	19 1.4	− 7 55.3	−1.1451	0.6057	0.0280	−37	−68
χ^1 Orionis	4.5	1.21	4.2	20 15.7	23 48.6	− 3 19.7	+1.0532	0.6032	0.0399	+90	+43
141 Tauri	6.3	1.26	3.9	22 23.9	**3** 2 36.6	− 0 38.5	−1.2126	0.6016	0.0467	−46	−68
χ^2 Orionis	4.7	1.25	4.6	20 8.4	3 30.5	+ 0 13.3	+1.0126	0.6010	0.0488	+90	+39
14 B. Geminorum	6.0	+1.29	− 4.2	+22 12.2	5 40.5	+ 2 18.0	−1.1721	0.5997	−0.0540	−40	−68
68 Orionis	5.7	1.28	4.9	19 48.5	6 40.8	+ 3 16.0	+1.1813	0.5991	0.0564	+90	+54
15 Geminorum	6.5	1.35	5.2	20 50.2	12 53.2	+ 9 13.6	−0.2504	0.5950	0.0707	+24	−36
16 Geminorum	6.2	1.35	5.3	20 32.7	12 57.4	+ 9 17.6	+0.0418	0.5949	0.0709	+41	−19
ν Geminorum	4.1	1.35	5.4	20 15.8	13 21.9	+ 9 41.2	+0.2971	0.5946	0.0718	+56	− 6
162 B. Geminorum	5.7	+1.59	− 8.5	+17 15.4	**4** 15 14.0	+10 34.6	+0.8188	0.5748	−0.1234	+90	+18
f Geminorum	5.3	1.63	8.6	17 51.5	18 30.3	−10 16.2	−0.2114	0.5722	0.1290	+26	−39
1 Cancri	6.0	1.69	9.8	16 0.3	**5** 2 7.9	− 2 55.0	+0.6721	0.5660	0.1412	+89	+ 8
2 B. Cancri	6.0	1.70	9.6	16 44.1	2 47.7	− 2 16.5	−0.1783	0.5655	0.1422	+28	−39
3 Cancri	5.7	1.72	9.4	17 31.7	3 46.9	− 1 19.5	−1.1420	0.5647	0.1437	−34	−73
5 Cancri	5.9	+1.72	− 9.7	+16 40.6	4 6.5	− 1 0.5	−0.3059	0.5644	−0.1441	+21	−47
30 B. Cancri	6.1	1.74	10.6	14 52.0	8 20.2	+ 3 4.3	+0.9516	0.5610	0.1502	+90	+24
29 Cancri	5.9	1.82	11.3	14 28.6	16 18.2	+10 46.0	+0.1225	0.5548	0.1606	+45	−25
84 B. Cancri	6.4	1.84	11.8	13 31.9	18 39.8	−10 57.1	+0.7292	0.5531	0.1635	+90	+ 8
A^1 Cancri	5.5	1.88	12.3	12 58.1	23 2.3	− 6 43.5	+0.5948	0.5498	0.1685	+79	0
A^2 Cancri	5.7	+1.89	−12.6	+12 24.3	**6** 0 47.0	− 5 2.3	+0.8927	0.5485	−0.1704	+90	+18

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

	The Star's					At Conjunction in R. A.					Limiting Parallels.	
	Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
			$\Delta\alpha$	$\Delta\delta$								
			s	″	° ′	d h m	h m				°	°
60	Cancri	5.7	+1.93	−13.0	+11 56.0	**6** 5 0.4	− 0 57.1	+0.6625	0.5456	−0.1747	+86	+ 3
α	Cancri	4.3	1.95	13.0	12 10.1	6 12.7	+ 0 12.8	+0.2030	0.5447	0.1759	+50	−22
κ	Cancri	5.1	1.98	13.7	10 59.5	10 38.1	+ 4 29.6	+0.6602	0.5417	0.1800	+86	+ 2
209 B.	Cancri	6.5	2.00	13.4	11 53.5	11 35.9	+ 5 25.6	−0.4656	0.5411	0.1808	+13	−62
222 B.	Cancri	6.3	2.04	13.6	11 50.2	15 29.7	+ 9 11.9	−1.1214	0.5385	0.1841	−29	−79
ω	Leonis	5.5	+2.07	−14.7	+ 9 24.4	20 40.6	− 9 47.0	+0.4956	0.5354	−0.1880	+70	− 9
h	Leonis	5.2	2.09	14.6	10 4.2	22 23.5	− 8 7.3	−0.5341	0.5344	0.1892	+ 9	−68
10 B.	Sextantis	6.0	2.15	15.9	7 4.7	**7** 5 27.4	− 1 16.5	+1.3058	0.5305	0.1936	+87	+52
14	Sextantis	6.3	2.24	16.6	6 0.2	15 51.6	+ 8 48.6	+0.4225	0.5255	0.1987	+64	−14
19	Sextantis	5.9	2.27	17.0	5 0.6	18 56.1	+11 47.7	+0.8776	0.5242	0.1998	+90	+12
237 B.	Leonis	6.3	+2.46	−18.5	+ 1 27.0	**8** 15 23.7	+ 7 39.2	+0.5930	0.5175	−0.2043	+77	− 6
55	Leonis	6.1	2.48	18.6	1 9.8	17 13.1	+ 9 25.4	+0.5312	0.5170	0.2044	+72	− 9
p^3	Leonis	6.1	2.52	18.8	0 25.8	21 23.6	−10 31.3	+0.4771	0.5162	0.2045	+68	−13
p^5	Leonis	5.3	2.57	18.8	+ 0 22.0	**9** 2 45.5	− 5 18.7	−0.5500	0.5153	0.2043	+ 8	−74
388 B.	Leonis	6.3	2.64	19.1	− 1 15.6	10 16.0	+ 1 59.0	−0.3054	0.5143	0.2034	+21	−56
ε	Leonis	5.1	+2.66	−19.5	− 2 33.7	11 33.3	+ 3 14.0	+0.8591	0.5142	−0.2032	+88	+10
431 B.	Leonis	6.2	2.69	19.2	1 59.6	15 51.7	+ 7 25.0	−0.6367	0.5139	0.2023	+ 3	−82
13 B.	Virginis	5.9	2.77	19.9	4 53.3	22 36.0	−10 2.2	+1.1851	0.5138	0.2004	+86	+35
78 B.	Virginis	6.5	2.88	19.4	5 16.4	**10** 10 58.9	+ 1 59.4	−0.8419	0.5144	0.1954	−10	−90
q	Virginis	5.3	2.99	19.7	9 0.6	21 21.1	−11 56.1	+1.2849	0.5156	0.1898	+81	+47
χ	Virginis	4.8	+3.00	−19.2	− 7 33.3	**11** 0 15.1	− 9 7.1	−0.8718	0.5161	−0.1880	−13	−90
ψ	Virginis	5.0	3.08	19.0	9 6.3	8 13.3	− 1 22.7	−0.6359	0.5176	0.1826	0	−83
49	Virginis	5.2	3.15	18.7	10 18.8	15 19.6	+ 5 31.3	−0.5758	0.5192	0.1770	+ 3	−77
50	Virginis	6.2	3.16	18.5	9 54.2	16 18.2	+ 6 28.2	−1.2029	0.5195	0.1762	−40	−90
i	Virginis	5.7	3.25	18.1	12 17.5	**12** 1 7.9	− 8 57.6	−0.0754	0.5218	0.1683	+29	−42
550 B.	Virginis	6.0	+3.29	−17.8	−12 48.3	5 14.5	− 4 58.2	−0.1898	0.5230	−0.1644	+22	−49
621 B.	Virginis	6.4	3.42	16.2	14 35.2	20 28.1	+ 9 48.2	−0.5890	0.5279	0.1478	− 1	−79
214 G.	Virginis	6.5	3.45	16.3	15 57.2	20 51.0	+10 10.3	+0.8727	0.5280	0.1473	+75	+12
40 H.	Virginis	5.1	3.47	16.0	15 55.5	23 41.4	−11 4.4	+0.4273	0.5290	0.1439	+56	−14
ι	Libræ	4.7	3.69	11.7	19 29.4	**14** 6 4.2	− 5 37.9	+0.6372	0.5395	0.1014	+66	− 2
25	Libræ	6.0	+3.69	−11.6	−19 20.8	6 36.4	− 5 6.6	+0.4241	0.5396	−0.1006	+51	−14
147 B.	Libræ	6.2	3.75	10.1	20 27.2	14 56.8	+ 2 58.0	+0.8694	0.5423	0.0872	+70	+14
150 B.	Libræ	6.1	3.73	10.0	19 53.5	15 29.7	+ 3 29.8	+0.1977	0.5425	0.0863	+35	−27
11 H.	Libræ	5.4	3.72	10.0	19 23.9	15 55.6	+ 3 54.9	−0.3872	0.5426	0.0856	+ 3	−63
172 B.	Libræ	5.9	3.76	9.4	20 45.1	18 37.2	+ 6 31.4	+0.8909	0.5434	0.0811	+70	+15
41	Libræ	5.3	+3.72	− 9.4	−19 2.3	18 57.0	+ 6 50.5	−1.0375	0.5435	−0.0806	−38	−90
κ	Libræ	5.0	3.73	9.2	19 25.2	20 24.2	+ 8 15.0	−0.7296	0.5440	0.0781	−17	−90
λ	Libræ	5.1	3.75	8.2	19 55.7	**15** 1 49.6	−10 30.1	−0.5631	0.5455	0.0688	− 8	−78
10 G.	Scorpii	5.9	3.78	7.7	20 45.1	3 52.8	− 8 31.0	+0.2122	0.5460	0.0652	+34	−26
ω^1	Scorpii	4.3	3.77	7.0	20 27.2	8 12.6	− 4 19.5	−0.3843	0.5471	0.0575	0	−63
ω^2	Scorpii	4.6	+3.78	− 6.9	−20 39.2	8 29.2	− 4 3.4	−0.1783	0.5472	−0.0570	+11	−49
84 B.	Scorpii	6.3	3.78	6.3	20 54.3	11 49.6	− 0 49.6	−0.0801	0.5480	0.0510	+16	−43
51 G.	Scorpii	6.5	3.79	6.0	21 6.3	13 0.0	+ 0 18.5	+0.0835	0.5482	0.0489	+25	−33
58 G.	Scorpii	6.2	3.76	5.9	20 1.4	14 1.6	+ 1 18.2	−1.1644	0.5485	0.0470	−52	−90
ω	Ophiuchi	4.5	3.79	4.6	21 17.7	20 6.7	+ 7 11.3	−0.0073	0.5497	0.0358	+18	−38
116 B.	Ophiuchi	6.3	+3.75	− 1.5	−21 27.2	**16** 11 59.2	− 1 27.6	−0.1642	0.5520	−0.0059	+ 7	−48
ξ	Ophiuchi	4.4	3.72	− 0.3	21 1.6	18 50.9	+ 5 10.4	−0.6298	0.5526	+0.0072	−18	−86
190 B.	Ophiuchi	5.9	3.72	+ 0.2	21 22.0	20 34.0	+ 6 50.1	−0.2394	0.5527	0.0105	+ 3	−53
52	Ophiuchi	6.4	3.71	1.2	21 59.4	**17** 1 27.8	+11 34.0	+0.5202	0.5529	0.0199	+49	− 8
58	Ophiuchi	4.8	3.68	1.9	21 38.7	5 13.8	− 8 47.4	+0.2288	0.5529	0.0271	+31	−25
16 G.	Sagittarii	6.4	+3.60	+ 3.1	−20 20.0	12 54.6	− 1 22.0	−0.9450	0.5528	+0.0418	−35	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's						At Conjunction in R. A.					Limiting Parallels.	
	Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
			Δα	Δδ								
			s	″	° ′	d h m	h m				°	°
30 G.	Sagittarii	6.2	+3.60	+ 3.9	−21 27.1	**17** 16 12.9	+ 1 49.7	+0.4298	0.5527	+0.0480	+46	−14
39 G.	Sagittarii	6.3	3.54	3.9	19 51.5	18 7.0	+ 3 40.0	−1.2217	0.5526	0.0516	−59	−89
μ	Sagittarii	4.0	3.57	4.4	21 4.8	19 15.7	+ 4 46.4	+0.1770	0.5525	0.0537	+31	−28
14	Sagittarii	5.6	3.58	4.6	21 44.1	19 29.1	+ 4 59.3	+0.9055	0.5525	0.0542	+69	+16
15	Sagittarii	5.3	3.56	4.5	20 45.1	19 56.4	+ 5 25.8	−0.1452	0.5525	0.0550	+13	−47
16	Sagittarii	5.9	+3.55	+ 4.4	−20 24.7	19 56.8	+ 5 26.1	−0.5171	0.5525	+0.0550	− 7	−73
21	Sagittarii	5.0	3.51	5.2	20 35.1	**18** 0 38.1	+ 9 58.1	−0.0494	0.5521	0.0637	+19	−41
121 B.	Sagittarii	5.9	3.47	6.4	21 7.1	6 54.5	− 7 58.0	+0.9681	0.5515	0.0752	+69	+21
128 B.	Sagittarii	6.3	3.45	7.0	21 5.0	9 53.2	− 5 5.2	+1.1609	0.5511	0.0806	+69	+38
29	Sagittarii	5.3	3.42	7.2	20 25.0	11 55.5	− 3 6.9	+0.6015	0.5510	0.0842	+61	− 4
36	Sagittarii	5.1	+3.39	+ 7.8	−20 45.7	15 29.3	+ 0 19.7	+1.2875	0.5505	+0.0905	+68	+64
171 B.	Sagittarii	6.1	3.33	7.9	19 21.7	18 10.6	+ 2 55.8	+0.0154	0.5501	0.0952	+25	−37
173 B.	Sagittarii	6.4	3.33	7.9	19 13.1	18 12.3	+ 2 57.4	−0.1375	0.5501	0.0952	+17	−46
187 B.	Sagittarii	6.4	3.30	8.1	18 51.7	20 5.3	+ 4 46.6	−0.3425	0.5498	0.0985	+ 7	−59
190 B.	Sagittarii	5.4	3.31	8.3	19 25.0	20 36.6	+ 5 16.9	+0.3107	0.5497	0.0994	+43	−20
195 B.	Sagittarii	6.3	+3.31	+ 8.5	−19 55.8	21 18.8	+ 5 57.7	+0.9386	0.5496	+0.1006	+71	+18
d	Sagittarii	5.0	3.26	8.9	19 5.7	**19** 0 59.2	+ 9 30.8	+0.4143	0.5491	0.1068	+50	−15
226 B.	Sagittarii	6.4	3.24	9.3	19 23.0	2 50.8	+11 18.8	+0.9279	0.5488	0.1100	+71	+17
ρ	Sagittarii	4.0	3.21	8.9	17 59.9	2 53.6	+11 21.6	−0.5677	0.5488	0.1100	− 5	−78
45	Sagittarii	6.0	3.22	9.0	18 27.4	2 57.8	+11 25.5	−0.0634	0.5488	0.1101	+23	−42
267 B.	Sagittarii	5.8	+3.14	+10.0	−18 24.5	10 6.1	− 5 40.2	+0.7119	0.5477	+0.1217	+72	+ 2
54	Sagittarii	5.4	3.09	9.7	16 28.6	11 51.1	− 3 58.7	−1.1578	0.5473	0.1245	−43	−90
e	Sagittarii	5.2	3.08	9.8	16 18.7	12 42.0	− 3 9.4	−1.2296	0.5472	0.1259	−51	−90
g	Sagittarii	5.1	2.98	10.5	15 42.3	19 59.2	+ 3 53.5	−0.9230	0.5460	0.1370	−23	−90
16 B.	Capricorni	6.2	2.85	11.6	15 2.3	**20** 6 48.4	− 9 38.4	−0.0681	0.5444	0.1524	+27	−42
β	Capricorni	3.2	+2.84	+11.6	−15 2.1	6 55.1	− 9 31.9	−0.0542	0.5444	+0.1526	+28	−42
27 G.	Capricorni	6.2	2.79	12.1	15 19.5	11 42.0	− 4 54.3	+1.0000	0.5437	0.1590	+75	+21
45 B.	Capricorni	6.1	2.76	12.0	13 59.8	13 12.0	− 3 27.1	−0.1772	0.5436	0.1610	+22	−48
84 B.	Capricorni	6.0	2.65	12.2	12 50.5	21 5.0	+ 4 10.6	−0.0988	0.5427	0.1707	+27	−44
16 B.	Aquarii	6.4	2.62	12.0	11 52.6	22 14.5	+ 5 17.9	−0.9247	0.5425	0.1721	−19	−90
ν	Aquarii	4.5	+2.53	+12.6	−11 41.8	**21** 6 7.9	−11 4.0	+0.2794	0.5420	+0.1810	+50	−23
51 G.	Aquarii	6.5	2.49	12.5	10 56.3	8 23.2	− 8 53.0	−0.1125	0.5418	0.1834	+28	−44
17	Aquarii	6.3	2.43	12.3	9 39.7	12 32.9	− 4 51.3	−0.6856	0.5417	0.1876	− 3	−89
19	Aquarii	5.6	2.42	12.5	10 5.4	13 38.0	− 3 48.4	−0.0294	0.5417	0.1886	+33	−40
ξ	Aquarii	4.8	2.34	12.2	8 12.9	19 39.0	+ 2 1.0	−0.8484	0.5417	0.1942	−12	−90
c^1	Capricorni	5.3	+2.30	+12.8	− 9 27.1	23 7.0	+ 5 22.4	+1.1261	0.5417	+0.1971	+81	+29
30	Aquarii	5.6	2.18	12.4	6 54.6	**22** 7 52.2	−10 9.2	+0.2242	0.5424	0.2038	+49	−26
138 B.	Aquarii	6.4	2.12	11.9	5 7.0	12 24.0	− 5 46.3	−0.7120	0.5429	0.2068	− 2	−90
44	Aquarii	5.7	2.10	12.2	5 47.3	14 28.7	− 3 45.5	+0.4169	0.5432	0.2081	+62	−15
51	Aquarii	5.8	2.06	12.1	5 14.6	17 48.7	− 0 32.0	+0.5479	0.5437	0.2100	+72	− 8
187 B.	Aquarii	6.3	+2.01	+11.4	− 3 19.4	21 14.2	+ 2 46.8	−0.7179	0.5444	+0.2116	− 2	−90
κ	Aquarii	5.2	1.98	11.9	4 38.6	**23** 0 17.2	+ 5 43.8	+1.2927	0.5450	0.2131	+86	+46
207 B.	Aquarii	6.3	1.96	11.7	3 58.3	1 43.5	+ 7 7.4	+0.9073	0.5453	0.2137	+87	+13
3	Piscium	6.3	1.86	10.6	0 14.8	11 3.9	− 7 50.6	−0.9132	0.5478	0.2167	−13	−90
22 B.	Piscium	6.4	1.74	10.5	− 0 9.0	21 42.7	+ 2 27.1	+1.3045	0.5515	0.2182	+90	+48
κ	Piscium	4.9	+1.72	+10.1	+ 0 48.9	23 16.9	+ 3 58.1	+0.6630	0.5522	+0.2182	+85	− 2
9	Piscium	6.4	1.72	10.2	0 40.8	23 25.6	+ 4 6.6	+0.8316	0.5522	0.2182	+90	+ 8
16	Piscium	5.7	1.68	9.8	1 39.3	**24** 3 38.0	+ 8 10.4	+0.7560	0.5540	0.2181	+90	+ 4
19	Piscium	5.4	1.63	9.3	3 2.4	8 11.6	−11 25.3	+0.3436	0.5561	0.2174	+58	−19
d	Piscium	5.4	1.50	7.4	7 44.6	23 31.1	+ 3 22.6	−1.0969	0.5641	0.2122	−27	−83
51	Piscium	5.6	+1.45	+ 7.6	+ 6 30.6	**25** 4 42.1	+ 8 22.8	+1.2306	0.5672	+0.2091	+90	+41

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0 Δα	Red'ns from 1919.0 Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
136 B. Piscium	6.5	+1.42	+ 6.7	+ 8 54.9	25 8 32.0	−11 55.6	−0.3797	0.5696	+0.2065	+17	−58
101 Piscium	6.2	1.28	4.2	14 14.9	26 7 32.9	+10 14.6	−1.1683	0.5850	0.1830	−35	−76
19 Arietis	5.8	+1.18	+ 3.2	+14 54.1	22 36.5	+ 0 43.5	+0.7792	0.5953	+0.1601	+90	+13
				NEW	MOON.						

JUNE.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
162 B. Geminorum	5.7	+1.34	− 8.2	+17 15.4	1 0 32.0	− 2 19.4	+0.7788	0.5845	−0.1256	+90	+16
f Geminorum	5.3	1.37	8.2	17 51.5	3 42.6	+ 0 44.1	−0.2382	0.5818	0.1313	+25	−41
1 Cancri	6.0	+1.41	− 9.2	+16 0.3	11 6.6	+ 7 51.7	+0.6327	0.5756	−0.1436	+84	+ 5
2 B. Cancri	6.0	1.42	9.1	16 44.1	11 45.2	+ 8 28.9	−0.2061	0.5750	0.1446	+26	−40
3 Cancri	5.7	1.43	8.9	17 31.7	12 42.6	+ 9 24.2	−1.1568	0.5742	0.1461	−35	−73
5 Cancri	5.9	1.43	9.2	16 40.6	13 1.6	+ 9 42.5	−0.3322	0.5738	0.1466	+20	−48
30 B. Cancri	6.1	1.45	9.9	14 52.0	17 7.8	−10 20.2	+0.9080	0.5704	0.1527	+90	+21
29 Cancri	5.9	+1.51	−10.5	+14 28.6	2 0 51.6	− 2 52.8	+0.0899	0.5640	−0.1632	+43	−26
84 B. Cancri	6.4	1.52	10.9	13 31.9	3 9.0	− 0 40.2	+0.6883	0.5621	0.1661	+90	+ 6
*A*¹ Cancri	5.5	1.56	11.3	12 58.1	7 23.7	+ 3 25.7	+0.5559	0.5586	0.1711	+75	− 2
*A*² Cancri	5.7	1.57	11.6	12 24.3	9 5.4	+ 5 4.0	+0.8498	0.5573	0.1730	+90	+15
60 Cancri	5.7	1.61	11.9	11 56.0	13 11.5	+ 9 1.8	+0.6229	0.5540	0.1774	+82	+ 1
α Cancri	4.3	+1.62	−11.9	+12 10.1	14 21.8	+10 9.7	+0.1695	0.5532	−0.1785	+48	−23
κ Cancri	5.1	1.65	12.5	10 59.5	18 39.7	− 9 41.0	+0.6210	0.5499	0.1826	+81	0
209 B. Cancri	6.5	1.67	12.2	11 53.5	19 35.9	− 8 46.7	−0.4899	0.5492	0.1834	+11	−64
222 B. Cancri	6.3	1.70	12.4	11 50.3	23 23.4	− 5 6.7	−1.1371	0.5464	0.1866	−31	−79
ω Leonis	5.5	1.74	13.4	9 24.4	3 4 26.0	− 0 13.9	+0.4596	0.5429	0.1905	+67	−11
h Leonis	5.2	+1.76	−13.2	+10 4.2	6 6.2	+ 1 23.2	−0.5570	0.5417	−0.1916	+ 8	−70
10 B. Sextantis	6.0	1.81	14.5	7 4.7	12 59.5	+ 8 3.3	+1.2612	0.5373	0.1959	+90	+45
25 B. Sextantis	6.3	1.85	14.8	6 20.2	16 41.3	+11 38.1	+1.3215	0.5350	0.1978	+84	+54
14 Sextantis	6.3	1.91	15.1	6 0.2	23 9.1	− 6 6.1	+0.3903	0.5314	0.2007	+62	−15
19 Sextantis	5.9	1.94	15.5	5 0.7	4 2 9.6	− 3 11.1	+0.8410	0.5298	0.2018	+90	+10
237 B. Leonis	6.3	+2.15	−16.9	+ 1 27.0	22 14.2	− 7 42.7	+0.5641	0.5212	−0.2056	+75	− 7
55 Leonis	6.1	2.17	17.0	1 9.9	5 0 1.9	− 5 58.2	+0.5034	0.5207	0.2056	+70	−11
*p*³ Leonis	6.1	2.21	17.3	0 25.9	4 8.5	− 1 58.8	+0.4506	0.5194	0.2056	+66	−14
*p*⁵ Leonis	5.3	2.27	17.2	+ 0 22.0	9 26.0	+ 3 9.3	−0.5671	0.5180	0.2052	+ 7	−75
388 B. Leonis	6.3	2.35	17.7	− 1 15.5	16 51.1	+10 21.6	−0.3231	0.5165	0.2040	+20	−57
e Leonis	5.1	+2.37	−18.1	− 2 33.7	18 7.5	+11 35.8	+0.8335	0.5163	−0.2037	+88	+ 8
431 B. Leonis	6.2	2.41	17.8	1 59.6	22 23.2	− 8 15.9	−0.6513	0.5156	0.2027	+ 2	−83
13 B. Virginis	5.9	2.50	18.6	4 53.3	6 5 3.9	− 1 46.8	+1.1608	0.5150	0.2006	+86	+32
78 B. Virginis	6.5	2.64	18.1	5 16.4	17 21.8	+10 9.9	−0.8528	0.5147	0.1954	−10	−90
q Virginis	5.3	2.78	18.9	9 0.6	7 3 41.2	− 3 48.4	+1.2668	0.5154	0.1896	+81	+44
χ Virginis	4.8	+2.80	−18.2	− 7 33.3	6 34.7	− 1 0.0	−0.8812	0.5157	−0.1877	−13	−90
ψ Virginis	5.0	2.91	18.2	9 6.3	14 31.8	+ 6 43.3	−0.6452	0.5168	0.1821	0	−84
49 Virginis	5.2	3.00	17.9	10 18.8	21 37.6	−10 23.2	−0.5843	0.5183	0.1765	+ 3	−78
50 Virginis	6.2	3.01	17.7	9 54.2	22 36.1	− 9 26.5	−1.2098	0.5185	0.1757	−41	−90
i Virginis	5.7	3.14	17.6	12 17.5	8 7 25.7	− 0 52.3	−0.0840	0.5206	0.1678	+29	−43
550 B. Virginis	6.0	+3.19	−17.3	−12 48.2	11 32.3	+ 3 7.1	−0.1977	0.5217	−0.1638	+22	−50
621 B. Virginis	6.4	3.38	16.0	14 35.2	9 2 46.6	− 6 5.8	−0.5950	0.5266	0.1473	− 1	−79
214 G. Virginis	6.5	3.41	16.3	15 57.2	3 9.6	− 5 43.6	+0.8644	0.5267	0.1469	+75	+11
40 H. Virginis	5.1	3.44	15.9	15 55.5	6 0.1	− 2 58.2	+0.4200	0.5277	0.1434	+55	−15
ι Libræ	4.7	3.81	12.0	19 29.4	10 12 23.8	+ 2 29.3	+0.6300	0.5389	0.1014	+65	− 2
25 Libræ	6.0	+3.81	−11.8	−19 20.8	12 56.0	+ 3 0.5	+0.4172	0.5391	−0.1006	+50	−15

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
147 B. Libræ	6.2	+3.91	-10.5	-20 27.2	10 21 16.1	+11 4.8	+0.8615	0.5421	-0.0873	+70	+13
150 B. Libræ	6.1	3.90	10.3	19 53.5	21 49.0	+11 36.7	+0.1907	0.5423	0.0863	+35	-27
11 H. Libræ	5.4	3.89	10.2	19 23.9	22 14.9	-11 58.2	-0.3933	0.5424	0.0856	+ 3	-63
172 B. Libræ	5.9	3.94	9.8	20 45.1	11 0 56.2	- 9 22.1	+0.8827	0.5433	0.0812	+70	+14
41 Libræ	5.3	3.90	9.6	19 2.3	1 16.0	- 9 3.0	-1.0428	0.5434	0.0806	-38	-90
κ Libræ	5.0	+3.92	- 9.4	-19 25.2	2 43.1	- 7 38.7	-0.7355	0.5440	-0.0782	-17	-90
λ Libræ	5.1	3.97	8.3	19 55.7	8 7.9	- 2 24.4	-0.5696	0.5457	0.0689	- 9	-78
10 G. Scorpii	5.9	4.01	8.0	20 45.1	10 10.7	- 0 25.5	+0.2042	0.5464	0.0653	+33	-26
ω^1 Scorpii	4.3	4.03	7.1	20 27.2	14 29.8	+ 3 45.2	-0.3918	0.5477	0.0577	0	-63
ω^2 Scorpii	4.6	4.04	7.1	20 39.2	14 46.4	+ 4 1.2	-0.1862	0.5478	0.0572	+11	-49
84 B. Scorpii	6.3	+4.06	- 6.4	-20 54.3	18 6.1	+ 7 14.4	-0.0885	0.5488	-0.0512	+15	-43
51 G. Scorpii	6.5	4.07	6.2	21 6.3	19 16.3	+ 8 22.3	+0.0746	0.5491	0.0491	+24	-34
58 G. Scorpii	6.2	4.04	5.9	20 1.4	20 17.7	+ 9 21.7	-1.1711	0.5494	0.0472	-53	-90
ω Ophiuchi	4.5	4.11	4.7	21 17.7	12 2 21.4	- 8 46.6	-0.0170	0.5509	0.0361	+18	-39
116 B. Ophiuchi	6.3	4.16	- 1.4	21 27.2	18 9.0	+ 6 29.6	-0.1763	0.5540	-0.0061	+ 6	-49
ξ Ophiuchi	4.4	+4.16	+ 0.1	-21 1.6	13 0 58.2	-10 54.8	-0.6422	0.5549	+0.0071	-19	-88
190 B. Ophiuchi	5.9	4.17	0.6	21 22.0	2 40.6	- 9 15.9	-0.2532	0.5551	0.0103	+ 3	-53
52 Ophiuchi	6.4	4.19	1.6	21 59.4	7 32.4	- 4 33.9	+0.5035	0.5554	0.0198	+48	- 9
58 Ophiuchi	4.8	4.17	2.4	21 38.7	11 16.8	- 0 56.9	+0.2119	0.5556	0.0270	+30	-26
16 G. Sagittarii	6.4	4.13	4.0	20 20.0	18 54.1	+ 6 24.9	-0.9611	0.5558	0.0417	-36	-90
30 G. Sagittarii	6.2	+4.15	+ 4.8	-21 27.1	22 10.9	+ 9 35.1	+0.4096	0.5557	+0.0480	+44	-15
39 G. Sagittarii	6.3	4.10	5.1	19 51.4	14 0 4.1	+11 24.5	-1.2387	0.5557	0.0516	-61	-86
μ Sagittarii	4.0	4.14	5.4	21 4.8	1 12.2	-11 29.6	+0.1565	0.5557	0.0538	+29	-29
14 Sagittarii	5.6	4.15	5.5	21 44.1	1 25.5	-11 16.9	+0.8834	0.5556	0.0542	+69	+15
15 Sagittarii	5.3	4.12	5.5	20 45.1	1 52.6	-10 50.6	-0.1651	0.5556	0.0551	+12	-48
16 Sagittarii	5.9	+4.11	+ 5.5	-20 24.7	1 53.0	-10 50.3	-0.5361	0.5556	+0.0551	- 8	-75
21 Sagittarii	5.0	4.10	6.5	20 35.1	6 32.0	- 6 20.6	-0.0709	0.5553	0.0638	+17	-42
121 B. Sagittarii	5.9	4.09	7.8	21 7.1	12 45.4	- 0 19.7	+0.9428	0.5548	0.0754	+69	+19
128 B. Sagittarii	6.3	4.08	8.4	21 5.0	15 42.7	+ 2 31.7	+1.1343	0.5544	0.0808	+69	+35
29 Sagittarii	5.3	4.05	8.8	20 24.9	17 44.0	+ 4 28.9	+0.5754	0.5542	0.0844	+58	- 6
36 Sagittarii	5.1	+4.04	+ 9.5	-20 45.6	21 16.2	+ 7 54.0	+1.2593	0.5538	+0.0907	+70	+53
171 B. Sagittarii	6.1	3.99	9.8	19 21.7	23 56.3	+10 28.7	-0.0116	0.5534	0.0955	+24	-38
173 B. Sagittarii	6.4	3.98	9.8	19 13.1	23 57.9	+10 30.3	-0.1643	0.5533	0.0955	+16	-48
187 B. Sagittarii	6.4	3.97	10.1	18 51.7	15 1 50.0	-11 41.3	-0.3696	0.5530	0.0988	+ 5	-61
190 B. Sagittarii	5.4	3.97	10.3	19 24.9	2 21.1	-11 11.2	+0.2824	0.5529	0.0997	+41	-22
195 B. Sagittarii	6.3	+3.98	+10.4	-19 55.8	3 3.0	-10 30.7	+0.9093	0.5528	+0.1009	+71	+16
d Sagittarii	5.0	3.94	11.0	19 5.7	6 41.8	- 6 59.2	+0.3845	0.5523	0.1071	+48	-16
226 B. Sagittarii	6.4	3.93	11.4	19 23.0	8 32.6	- 5 12.0	+0.8970	0.5519	0.1102	+71	+15
ρ Sagittarii	4.0	3.90	11.2	17 59.9	8 35.5	- 5 9.2	-0.5971	0.5519	0.1103	- 7	-81
45 Sagittarii	6.0	3.91	11.3	18 27.4	8 39.6	- 5 5.3	-0.0934	0.5519	0.1104	+21	-43
267 B. Sagittarii	5.8	+3.86	+12.5	-18 24.5	15 45.1	+ 1 46.2	+0.6791	0.5506	+0.1221	+70	0
54 Sagittarii	5.4	3.80	12.5	16 28.6	17 29.5	+ 3 27.2	-1.1901	0.5502	0.1249	-47	-90
e Sagittarii	5.2	3.79	12.6	16 18.7	18 20.0	+ 4 15.9	-1.2622	0.5501	0.1262	-56	-86
g Sagittarii	5.1	3.72	13.6	15 42.2	16 1 34.9	+11 16.6	-0.9588	0.5486	0.1373	-26	-90
16 B. Capricorni	6.2	3.62	15.0	15 2.2	12 21.7	- 2 17.8	-0.1078	0.5464	0.1527	+25	-44
β Capricorni	3.2	+3.61	+15.0	-15 2.0	12 28.4	- 2 11.3	-0.0940	0.5464	+0.1528	+26	-43
27 G. Capricorni	6.2	3.57	15.7	15 19.4	17 14.7	+ 2 25.7	+0.9601	0.5454	0.1592	+75	+18
45 B. Capricorni	6.1	3.54	15.7	13 59.8	18 44.5	+ 3 52.7	-0.2194	0.5451	0.1611	+20	-51
84 B. Capricorni	6.0	3.45	16.2	12 50.4	17 2 37.3	+11 30.2	-0.1437	0.5436	0.1707	+25	-46
16 B. Aquarii	6.4	3.42	16.2	11 52.6	3 46.9	-11 22.4	-0.9723	0.5434	0.1721	-22	-90
ν Aquarii	4.5	+3.34	+16.9	-11 41.7	11 41.3	- 3 43.2	+0.2327	0.5421	+0.1807	+47	-25

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's						At Conjunction in R. A.					Limiting Parallels.	
	Name.	Mag.	Red'ns from 1919.0. Δα	Red'ns from 1919.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
			s	″	° ′	d h m	h m				°	°
51 G.	Aquarii	6.5	+3.30	+16.9	−10 56.2	17 13 57.0	− 1 31.8	−0.1614	0.5418	+0.1830	+25	−47
17	Aquarii	6.3	3.24	16.9	9 39.6	18 7.8	+ 2 30.9	−0.7385	0.5413	0.1871	− 6	−90
19	Aquarii	5.6	3.24	17.0	10 5.4	19 13.4	+ 3 34.5	−0.0797	0.5412	0.1881	+30	−43
ξ	Aquarii	4.8	3.16	17.0	8 12.8	18 1 16.6	+ 9 26.1	−0.9050	0.5406	0.1935	−15	−90
c^1	Capricorni	5.3	3.13	17.6	9 27.0	4 46.2	−11 11.0	+1.0799	0.5403	0.1963	+81	+26
30	Aquarii	5.6	+3.02	+17.4	− 6 54.6	13 36.8	− 2 37.4	+0.1705	0.5400	+0.2027	+46	−28
138 B.	Aquarii	6.4	2.95	17.0	5 7.0	18 11.8	+ 1 48.9	−0.7740	0.5401	0.2055	− 6	−90
44	Aquarii	5.7	2.94	17.3	5 47.2	20 18.2	+ 3 51.3	+0.3633	0.5401	0.2067	+59	−18
51	Aquarii	5.8	2.90	17.3	5 14.6	23 41.1	+ 7 7.8	+0.4949	0.5402	0.2084	+68	−11
187 B.	Aquarii	6.3	2.85	16.7	3 19.3	19 3 9.8	+10 29.7	−0.7828	0.5405	0.2100	− 5	−90
κ	Aquarii	5.2	+2.82	+17.2	− 4 38.5	6 15.8	−10 30.2	+1.2459	0.5408	+0.2113	+86	+40
207 B.	Aquarii	6.3	2.80	17.1	3 58.3	7 43.6	− 9 5.2	+0.8567	0.5410	0.2118	+87	+ 9
3	Piscium	6.3	2.70	16.0	0 14.7	17 14.8	+ 0 7.7	−0.9837	0.5424	0.2144	−18	−90
22 B.	Piscium	6.4	2.58	15.9	− 0 8.9	20 4 8.0	+10 39.9	+1.2589	0.5450	0.2155	+90	+42
κ	Piscium	4.9	2.56	15.5	+ 0 49.0	5 44.5	−11 46.8	+0.6096	0.5455	0.2155	+79	− 5
9	Piscium	6.4	+2.56	+15.6	+ 0 40.9	5 53.5	−11 38.0	+0.7804	0.5455	+0.2155	+90	+ 5
16	Piscium	5.7	2.51	15.2	1 39.4	10 12.2	− 7 27.8	+0.7040	0.5469	0.2152	+90	0
19	Piscium	5.4	2.47	14.6	3 2.5	14 53.2	− 2 56.1	+0.2866	0.5485	0.2145	+55	−22
d	Piscium	5.4	2.32	12.3	7 44.6	21 6 39.5	−11 41.4	−1.1731	0.5553	0.2089	−33	−83
51	Piscium	5.6	2.26	12.5	6 30.7	12 0.2	− 6 31.6	+1.1896	0.5580	0.2059	+90	+37
136 B.	Piscium	6.5	+2.23	+11.4	+ 8 55.0	15 57.5	− 2 42.4	−0.4441	0.5601	+0.2032	+14	−62
101	Piscium	6.2	2.04	8.0	14 15.0	22 15 44.6	− 3 45.8	−1.2381	0.5747	0.1800	−43	−76
19	Arietis	5.8	1.90	6.4	14 54.2	23 7 18.4	+11 13.3	+0.7454	0.5851	0.1578	+90	+11
27	Arietis	6.4	1.86	5.0	17 20.9	14 33.6	− 5 48.0	−0.5958	0.5899	0.1454	+ 5	−66
36	Arietis	6.5	1.81	4.4	17 25.4	19 56.8	− 0 37.3	+0.0866	0.5934	0.1355	+43	−23
40	Arietis	6.0	+1.80	+ 4.1	+17 56.9	21 37.3	+ 0 59.3	−0.2122	0.5945	+0.1323	+26	−39
π	Arietis	5.2	1.79	4.3	17 7.8	21 55.9	+ 1 17.1	+0.6442	0.5947	0.1317	+86	+ 8
45	Arietis	6.0	1.78	3.8	18 0.3	24 0 30.6	+ 3 45.8	+0.1051	0.5962	0.1266	+44	−21
ρ	Arietis	5.6	1.78	3.8	17 42.1	0 45.0	+ 3 59.6	+0.4374	0.5964	0.1261	+66	− 3
53	Arietis	6.0	1.73	3.4	17 34.1	5 5.6	+ 8 9.9	+1.0976	0.5989	0.1172	+90	+40
54	Arietis	6.5	+1.74	+ 3.2	+18 29.2	5 26.6	+ 8 30.1	+0.2271	0.5991	+0.1165	+51	−13
δ	Arietis	4.5	1.75	2.8	19 25.3	6 42.9	+ 9 43.4	−0.5569	0.5998	0.1138	+ 7	−60
63	Arietis	5.2	1.72	2.1	20 27.2	11 2.8	−10 7.1	−1.1084	0.6022	0.1044	−32	−70
65	Arietis	6.0	1.72	2.0	20 31.0	11 41.8	− 9 29.7	−1.1040	0.6025	0.1030	−32	−70
175 B.	Arietis	6.4	1.68	2.4	18 28.5	12 43.8	− 8 30.2	+1.0299	0.6031	0.1007	+90	+36
14 H^1.	Tauri	6.5	+1.68	+ 1.4	+20 39.2	17 19.1	− 4 6.0	−0.6946	0.6053	+0.0902	− 2	−68
13	Tauri	5.6	1.65	1.5	19 26.5	18 36.3	− 2 51.9	+0.6210	0.6059	0.0872	+84	+11
14	Tauri	6.2	1.65	1.4	19 24.6	19 10.0	− 2 19.7	+0.7010	0.6061	0.0859	+90	+16
22 H^1.	Tauri	6.1	1.66	+ 1.1	20 40.5	19 25.0	− 2 5.2	−0.5312	0.6062	0.0853	+ 8	−55
A	Tauri	4.5	1.62	0.0	21 51.7	25 3 7.0	+ 5 17.9	−1.1222	0.6092	0.0667	−34	−69
39	Tauri	6.1	+1.62	0.0	+21 47.5	3 21.5	+ 5 31.8	−1.0364	0.6093	+0.0661	−26	−69
192 B.	Tauri	6.1	1.60	− 0.3	22 12.4	6 12.6	+ 8 15.8	−1.2688	0.6102	0.0591	−59	−68
ω	Tauri	4.8	1.56	0.2	20 22.8	7 54.1	+ 9 53.2	+0.6372	0.6107	0.0548	+87	+15
51	Tauri	5.6	1.58	0.4	21 22.9	8 18.6	+10 16.7	−0.3336	0.6108	0.0538	+19	−39
53	Tauri	5.3	1.57	0.4	20 56.8	8 42.9	+10 39.9	+0.1190	0.6109	0.0528	+45	−13
56	Tauri	5.2	+1.58	− 0.5	+21 34.7	8 46.4	+10 43.3	−0.5037	0.6109	+0.0526	+ 9	−51
					NEW	*MOON.*						
29	Cancri	5.9	+1.42	− 9.9	+14 28.6	29 10 38.3	+ 8 42.0	+0.1563	0.5708	−0.1644	+47	−23
84 B.	Cancri	6.4	1.42	10.2	13 31.9	12 52.9	+10 51.8	+0.7519	0.5690	0.1674	+90	+10
A^1	Cancri	5.5	+1.44	−10.5	+12 58.2	17 2.3	− 9 7.6	+0.8238	0.5658	−0.1726	+82	+ 2

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.		Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
			Δα	Δδ								
			s	″	° ′	d h m	h m				°	°
A^2	Cancri	5.7	+1.44	-10.7	+12 24.3	**29** 18 41.8	- 7 31.5	+0.9166	0.5645	-0.1745	+90	+19
60	Cancri	5.7	1.47	11.0	11 56.0	22 42.6	- 3 39.1	+0.6947	0.5614	0.1790	+90	+ 5
α	Cancri	4.3	1.48	11.0	12 10.1	23 51.3	- 2 32.8	+0.2463	0.5606	0.1802	+52	-20
κ	Cancri	5.1	1.49	11.4	10 59.5	**30** 4 3.3	+ 1 30.6	+0.6970	0.5574	0.1844	+90	+ 4
209 B.	Cancri	6.5	1.51	11.3	11 53.5	4 58.2	+ 2 23.6	-0.4028	0.5568	0.1853	+16	-58
222 B.	Cancri	6.3	+1.53	-11.4	+11 50.3	8 40.4	+ 5 58.3	-1.0406	0.5541	-0.1886	-23	-79
ω	Leonis	5.5	1.55	12.1	9 24.4	13 35.8	+10 43.9	+0.5444	0.5505	0.1925	+74	- 6
h	Leonis	5.2	1.57	12.0	10 4.2	15 13.6	-11 41.4	-0.4609	0.5494	0.1937	+13	-63
10 B.	Sextantis	6.0	+1.60	-13.0	+ 7 4.8	21 56.9	- 5 11.4	+1.3439	0.5449	-0.1981	+77	+61

JULY.

Name.		Mag.	Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
14	Sextantis	6.3	+1.68	-13.5	+ 6 0.2	**1** 7 51.6	+ 4 24.3	+0.4885	0.5388	-0.2030	+69	-10
19	Sextantis	5.9	1.70	13.9	5 0.7	10 47.8	+ 7 15.0	+0.9364	0.5372	0.2041	+90	+15
155 B.	Leonis	6.5	1.74	13.7	6 6.1	15 55.1	-11 47.4	-1.2641	0.5344	0.2056	-43	-84
237 B.	Leonis	6.3	+1.88	-15.2	+ 1 27.0	**2** 6 24.3	+ 2 15.2	+0.6733	0.5277	-0.2077	+86	- 1
55	Leonis	6.1	1.90	15.2	1 9.9	8 9.6	+ 3 57.2	+0.6140	0.5270	0.2078	+80	- 5
p^3	Leonis	6.1	1.94	15.4	0 25.9	12 10.9	+ 7 51.3	+0.5636	0.5256	0.2077	+75	- 7
p^5	Leonis	5.3	1.99	15.4	+ 0 22.0	17 21.8	-11 7.0	-0.4424	0.5238	0.2072	+14	-65
388 B.	Leonis	6.3	2.07	15.8	- 1 15.5	**3** 0 38.0	- 4 3.9	-0.1985	0.5219	0.2059	+27	-49
e	Leonis	5.1	+2.08	-16.2	- 2 33.6	1 53.0	- 2 51.1	+0.9480	0.5215	-0.2056	+88	+15
431 B.	Leonis	6.2	2.13	15.9	1 59.5	6 4.0	+ 1 12.5	-0.5225	0.5205	0.2044	+ 9	-71
13 B.	Virginis	5.9	2.22	16.8	4 53.2	12 37.8	+ 7 34.8	+1.2754	0.5193	0.2022	+86	+44
78 B.	Virginis	6.5	2.36	16.4	5 16.4	**4** 0 44.5	- 4 39.7	-0.7210	0.5181	0.1966	- 2	-90
χ	Virginis	4.8	2.53	16.6	7 33.3	13 47.7	+ 8 0.7	-0.7505	0.5180	0.1887	- 5	-90
ψ	Virginis	5.0	+2.64	-16.6	- 9 6.2	21 40.2	- 8 20.6	-0.5174	0.5186	-0.1829	+ 7	-71
49	Virginis	5.2	2.74	16.4	10 18.7	**5** 4 42.6	- 1 30.6	-0.4587	0.5195	0.1772	+10	-66
50	Virginis	6.2	2.75	16.2	9 54.1	5 40.7	- 0 34.3	-1.0812	0.5196	0.1763	-29	-90
i	Virginis	5.7	2.89	16.3	12 17.5	14 27.1	+ 7 56.7	+0.0360	0.5212	0.1683	+36	-36
550 B.	Virginis	6.0	2.95	16.1	12 48.2	18 32.6	+11 54.9	-0.0787	0.5220	0.1643	+29	-42
621 B.	Virginis	6.4	+3.17	-15.0	-14 35.2	**6** 9 44.2	+ 2 39.4	-0.4817	0.5260	-0.1476	+ 5	-69
214 G.	Virginis	6.5	3.20	15.4	15 57.2	10 7.1	+ 3 1.6	+0.9728	0.5261	0.1471	+75	+19
40 H.	Virginis	5.1	3.24	15.0	15 55.4	12 57.5	+ 5 46.8	+0.5284	0.5269	0.1438	+63	- 9
ι	Libræ	4.7	3.70	11.6	19 29.4	**7** 19 21.8	+11 14.9	+0.7181	0.5373	0.1018	+71	+ 3
25	Libræ	6.0	3.70	11.5	19 20.8	19 54.0	+11 46.1	+0.5053	0.5375	0.1009	+56	- 9
147 B.	Libræ	6.2	+3.83	-10.3	-20 27.2	**8** 4 14.8	- 4 8.9	+0.9420	0.5405	-0.0878	+70	+18
150 B.	Libræ	6.1	3.82	10.1	19 53.5	4 47.8	- 3 36.9	+0.2720	0.5408	0.0869	+40	-22
11 H.	Libræ	5.4	3.82	9.8	19 23.9	5 13.7	- 3 11.8	-0.3113	0.5409	0.0862	+ 8	-57
172 B.	Libræ	5.9	3.88	9.7	20 45.1	7 55.3	- 0 35.4	+0.9600	0.5419	0.0818	+70	+20
41	Libræ	5.3	3.84	9.2	19 2.3	8 15.1	- 0 16.2	-0.9622	0.5420	0.0812	-32	-90
κ	Libræ	5.0	+3.86	- 9.0	-19 25.2	9 42.3	+ 1 8.2	-0.6568	0.5425	-0.0788	-13	-89
λ	Libræ	5.1	3.94	8.1	19 55.7	15 7.5	+ 6 22.9	-0.4961	0.5444	0.0696	- 4	-72
10 G.	Scorpii	5.9	3.98	7.9	20 45.1	17 10.4	+ 8 21.8	+0.2744	0.5450	0.0661	+38	-22
β	Scorpii	2.9	3.99	6.8	19 35.2	20 51.7	+11 55.9	-1.2437	0.5463	0.0596	-60	-85
56 B.	Scorpii	5.0	3.99	6.8	19 35.0	20 51.9	+11 56.1	-1.2482	0.5463	0.0596	-61	-84
ω^1	Scorpii	4.3	+4.02	- 7.0	-20 27.2	21 29.8	-11 27.2	-0.3245	0.5465	-0.0585	+ 4	-58
ω^2	Scorpii	4.6	4.03	7.0	20 39.2	21 46.4	-11 11.1	-0.1196	0.5466	0.0580	+14	-45
84 B.	Scorpii	6.3	4.07	6.3	20 54.3	**9** 1 6.2	- 7 57.9	-0.0253	0.5476	0.0521	+19	-39
51 G.	Scorpii	6.5	4.09	6.1	21 6.3	2 16.4	- 6 50.0	+0.1363	0.5480	0.0500	+28	-30
58 G.	Scorpii	6.2	4.06	5.6	20 1.4	3 17.8	- 5 50.7	-1.1078	0.5483	0.0481	-46	-90
ω	*Ophiuchi*	4.5	+4.16	- 4.6	-21 17.7	9 21.6	+ 0 1.2	+0.0378	0.5501	-0.0370	+21	-36

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0. Δα	Red'ns from 1919.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
123 B. Scorpii	6.5	+4.16	− 3.5	−20 15.1	9 13 18.2	+ 3 50.0	−1.2419	0.5512	−0.0297	−62	−85
116 B. Ophiuchi	6.3	4.29	− 1.2	21 27.2	10 1 8.0	− 8 43.8	−0.1378	0.5540	−0.0072	+ 9	−46
ξ Ophiuchi	4.4	4.33	+ 0.3	21 1.6	7 56.1	− 2 9.4	−0.6100	0.5552	+0.0058	−17	−83
190 B. Ophiuchi	5.9	4.34	0.8	21 22.0	9 38.2	− 0 30.7	−0.2240	0.5555	0.0092	+ 4	−52
52 Ophiuchi	6.4	4.39	1.8	21 59.4	14 28.9	+ 4 10.2	+0.5248	0.5562	0.0187	+50	− 8
58 Ophiuchi	4.8	+4.39	+ 2.7	−21 38.7	18 12.2	+ 7 46.0	+0.2297	0.5566	+0.0259	+31	−25
16 G. Sagittarii	6.4	4.38	4.6	20 20.0	11 1 47.0	− 8 54.6	−0.9484	0.5572	0.0406	−35	−90
30 G. Sagittarii	6.2	4.42	5.2	21 27.1	5 2.5	− 5 45.7	+0.4135	0.5574	0.0469	+45	−14
39 G. Sagittarii	6.3	4.38	5.8	19 51.4	6 54.9	− 3 57.1	−1.2311	0.5575	0.0505	−59	−87
μ Sagittarii	4.0	4.42	6.0	21 4.8	8 2.6	− 2 51.7	+0.1576	0.5576	0.0527	+29	−29
14 Sagittarii	5.6	+4.44	+ 6.0	−21 44.0	8 15.8	− 2 38.9	+0.8814	0.5576	+0.0531	+69	+14
15 Sagittarii	5.3	4.41	6.1	20 45.1	8 42.6	− 2 13.1	−0.1636	0.5576	0.0540	+12	−48
16 Sagittarii	5.9	4.40	6.2	20 24.7	8 43.0	− 2 12.7	−0.5333	0.5576	0.0540	− 8	−75
21 Sagittarii	5.0	4.42	7.2	20 35.0	13 20.0	+ 2 15.0	−0.0756	0.5576	0.0628	+17	−42
115 B. Sagittarii	5.7	4.45	8.4	21 27.8	19 2.7	+ 7 46.1	+1.2676	0.5575	0.0735	+69	+57
121 B. Sagittarii	5.9	+4.44	+ 8.5	−21 7.0	19 30.2	+ 8 12.7	+0.9259	0.5575	+0.0744	+69	+17
128 B. Sagittarii	6.3	4.44	9.2	21 4.9	22 25.7	+11 2.2	+1.1128	0.5574	0.0799	+69	+33
29 Sagittarii	5.3	4.42	9.7	20 24.9	12 0 25.8	−11 1.7	+0.5536	0.5572	0.0836	+58	− 7
36 Sagittarii	5.1	4.43	10.4	20 45.6	3 55.9	− 7 38.8	+1.2297	0.5569	0.0900	+70	+47
171 B. Sagittarii	6.1	4.39	11.0	19 21.7	6 34.3	− 5 5.7	−0.0389	0.5567	0.0948	+23	−40
173 B. Sagittarii	6.4	+4.38	+11.0	−19 13.1	6 35.9	− 5 4.1	−0.1909	0.5567	+0.0948	+15	−49
187 B. Sagittarii	6.4	4.38	11.4	18 51.7	8 26.8	− 3 16.9	−0.3977	0.5565	0.0981	+ 4	−63
190 B. Sagittarii	5.4	4.39	11.6	19 24.9	8 57.5	− 2 47.3	+0.2506	0.5564	0.0990	+40	−24
195 B. Sagittarii	6.3	4.40	11.6	19 55.7	9 38.9	− 2 7.3	+0.8737	0.5564	0.1002	+71	+13
d Sagittarii	5.0	4.37	12.4	19 5.7	13 15.3	+ 1 21.8	+0.3465	0.5560	0.1064	+46	−18
226 B. Sagittarii	6.4	+4.38	+12.8	−19 23.0	15 4.7	+ 3 7.6	+0.8540	0.5558	+0.1097	+71	+12
ρ Sagittarii	4.0	4.34	12.8	17 59.8	15 7.5	+ 3 10.3	−0.6328	0.5558	0.1098	− 8	−85
45 Sagittarii	6.0	4.36	12.8	18 27.3	15 11.6	+ 3 14.2	−0.1317	0.5558	0.1099	+19	−46
266 B. Sagittarii	6.1	4.35	14.2	19 1.7	21 54.1	+ 9 43.2	+1.2583	0.5548	0.1212	+71	+50
267 B. Sagittarii	5.8	4.33	14.2	18 24.5	22 11.9	+10 0.4	+0.6276	0.5548	0.1217	+67	− 3
54 Sagittarii	5.4	+4.28	+14.5	−16 28.6	23 54.9	+11 39.9	−1.2347	0.5545	+0.1246	−52	−90
g Sagittarii	5.1	4.23	15.9	15 42.2	13 7 53.8	− 4 37.0	−1.0152	0.5532	0.1371	−29	−90
16 B. Capricorni	6.2	4.17	17.6	15 2.2	18 31.5	+ 5 39.5	−0.1828	0.5513	0.1527	+21	−49
β Capricorni	3.2	4.18	17.6	15 2.0	18 38.1	+ 5 46.0	−0.1693	0.5512	0.1529	+22	−48
27 G. Capricorni	6.2	4.15	18.4	15 19.4	23 20.3	+10 18.8	+0.8732	0.5504	0.1593	+75	+12
45 B. Capricorni	6.1	+4.12	+18.5	−13 59.7	14 0 48.8	+11 44.3	−0.3024	0.5501	+0.1612	+16	−56
84 B. Capricorni	6.0	4.06	19.4	12 50.4	8 34.9	− 4 44.8	−0.2374	0.5487	0.1710	+20	−52
16 B. Aquarii	6.4	4.03	19.5	11 52.5	9 43.5	− 3 38.4	−1.0636	0.5484	0.1724	−29	−90
ν Aquarii	4.5	3.98	20.4	11 41.7	17 31.2	+ 3 54.1	+0.1257	0.5471	0.1811	+42	−31
51 G. Aquarii	6.5	3.95	20.5	10 56.1	19 45.0	+ 6 3.4	−0.2695	0.5467	0.1835	+20	−54
17 Aquarii	6.3	+3.90	+20.8	− 9 39.6	23 52.4	+10 2.8	−0.8494	0.5461	+0.1876	−12	−90
19 Aquarii	5.6	3.90	20.9	10 5.3	15 0 57.1	+11 5.6	−0.1947	0.5460	0.1886	+25	−49
ξ Aquarii	4.8	3.84	21.2	8 12.7	6 55.7	− 7 7.5	−1.0243	0.5452	0.1940	−23	−90
c^1 Capricorni	5.3	3.82	21.7	9 26.9	10 22.8	− 3 47.1	+0.9496	0.5448	0.1968	+81	+16
c^2 Capricorni	6.3	3.82	21.8	9 38.7	10 58.9	− 3 12.1	+1.2733	0.5447	0.1973	+81	+45
30 Aquarii	5.6	+3.73	+21.9	− 6 54.5	19 7.4	+ 4 40.6	+0.0336	0.5440	+0.2031	+39	−36
138 B. Aquarii	6.4	3.68	21.7	5 6.9	23 39.7	+ 9 4.2	−0.9136	0.5438	0.2059	−13	−90
44 Aquarii	5.7	3.67	22.0	5 47.2	16 1 44.9	+11 5.4	+0.2192	0.5437	0.2070	+50	−26
51 Aquarii	5.8	3.64	22.0	5 14.5	5 6.1	− 9 40.0	+0.3473	0.5436	0.2087	+58	−19
187 B. Aquarii	6.3	3.60	21.7	3 19.2	8 33.2	− 6 19.5	−0.9319	0.5436	0.2103	−15	−90
κ Aquarii	5.2	+3.57	+22.1	− 4 38.4	11 37.9	− 3 20.7	+1.0919	0.5437	+0.2115	+86	+26

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0. Δα	Red'ns from 1919.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
207 B. Aquarii	6.3	+3.56	+22.1	− 3 58.2	**16** 13 5.2	− 1 56.2	+0.7018	0.5437	+0.2120	+87	0
6 G. Piscium	6.2	3.48	21.9	2 49.4	21 25.4	+ 6 7.9	+1.2860	0.5442	0.2142	+88	+45
3 Piscium	6.3	3.47	21.3	0 14.6	22 33.7	+ 7 14.0	−1.1460	0.5443	0.2144	−31	−90
22 B. Piscium	6.4	3.38	21.3	− 0 8.8	**17** 9 26.0	− 6 14.8	+1.0919	0.5458	0.2152	+90	+26
κ Piscium	4.9	3.36	20.9	+ 0 49.1	11 2.6	− 4 41.4	+0.4407	0.5461	0.2151	+65	−14
9 Piscium	6.4	+3.36	+21.0	+ 0 41.0	11 11.6	− 4 32.8	+0.6117	0.5461	+0.2151	+79	− 5
16 Piscium	5.7	3.32	20.6	1 39.5	15 30.8	− 0 22.0	+0.5334	0.5470	0.2147	+72	− 9
19 Piscium	5.4	3.28	20.1	3 2.6	20 12.7	+ 4 10.7	+0.1129	0.5481	0.2138	+44	−31
22 Piscium	5.8	3.25	20.2	2 29.1	22 49.1	+ 6 41.9	+1.2424	0.5488	0.2132	+90	+40
d Piscium	5.4	3.16	17.9	7 44.7	**18** 12 6.0	− 4 27.5	−1.3590	0.5529	0.2078	−66	−70
51 Piscium	5.6	+3.10	+18.0	+ 6 30.8	17 30.4	+ 0 46.0	+1.0177	0.5550	+0.2046	+90	+21
136 B. Piscium	6.5	3.08	16.8	8 55.1	21 30.7	+ 4 38.1	−0.6269	0.5566	0.2019	+ 4	−78
π Piscium	5.6	2.86	13.7	11 43.9	**19** 22 19.4	+ 4 35.2	+1.2390	0.5687	0.1776	+90	+46
19 Arietis	5.8	2.75	10.8	14 54.2	**20** 13 40.8	− 4 36.8	+0.5897	0.5772	0.1562	+79	+ 2
27 Arietis	6.4	2.71	8.9	17 20.9	21 7.9	+ 2 33.8	−0.7625	0.5814	0.1440	− 5	−73
36 Arietis	6.5	+2.65	+ 8.1	+17 25.4	**21** 2 40.5	+ 7 53.9	−0.0667	0.5844	+0.1342	+34	−32
40 Arietis	6.0	2.64	7.8	17 57.0	4 24.0	+ 9 33.5	−0.3678	0.5854	0.1311	+17	−49
π Arietis	5.2	2.62	8.0	17 7.8	4 43.2	+ 9 52.0	+0.5001	0.5856	0.1305	+71	− 1
45 Arietis	6.0	2.61	7.3	18 0.4	7 22.4	−11 34.9	−0.0436	0.5870	0.1255	+35	−30
ρ Arietis	5.6	2.61	7.3	17 42.2	7 37.3	−11 20.5	+0.2933	0.5871	0.1250	+56	−12
53 Arietis	6.0	+2.55	+ 6.8	+17 34.2	12 5.8	− 7 2.3	+0.9669	0.5895	+0.1163	+90	+29
54 Arietis	6.5	2.56	6.4	18 29.2	12 27.5	− 6 41.5	+0.0852	0.5896	0.1156	+43	−21
δ Arietis	4.5	2.57	6.0	19 25.4	13 46.1	− 5 25.8	−0.7082	0.5903	0.1129	− 2	−71
63 Arietis	5.2	2.54	5.0	20 27.3	18 14.0	− 1 8.3	−1.2627	0.5925	0.1037	−53	−70
65 Arietis	6.0	2.53	4.9	20 31.1	18 54.3	− 0 29.6	−1.2576	0.5928	0.1023	−52	−70
175 B. Arietis	6.4	+2.48	+ 5.4	+18 28.5	19 58.3	+ 0 31.9	+0.9069	0.5933	+0.1001	+90	+26
14 H¹. Tauri	6.5	2.47	4.0	20 39.2	**22** 0 42.2	+ 5 4.8	−0.8360	0.5954	0.0898	−11	−70
13 Tauri	5.6	2.43	4.2	19 26.6	2 1.8	+ 6 21.2	+0.4994	0.5960	0.0869	+72	+ 3
14 Tauri	6.2	2.43	4.0	19 24.7	2 36.6	+ 6 54.7	+0.5812	0.5963	0.0856	+80	+ 8
22 H¹. Tauri	6.1	2.45	3.6	20 40.5	2 52.1	+ 7 9.6	−0.6678	0.5964	0.0850	0	−67
A Tauri	4.5	+2.39	+ 2.1	+21 51.7	10 48.6	− 9 12.7	−1.2572	0.5994	+0.0669	−55	−69
39 Tauri	6.1	2.38	2.0	21 47.5	11 3.6	− 8 58.4	−1.1699	0.5995	0.0663	−40	−69
ω Tauri	4.8	2.30	1.8	20 22.8	15 44.7	− 4 28.5	+0.5328	0.6009	0.0552	+75	+ 8
51 Tauri	5.6	2.32	1.4	21 23.0	16 9.9	− 4 4.2	−0.4507	0.6010	0.0542	+12	−48
53 Tauri	5.3	2.30	1.5	20 56.9	16 34.9	− 3 40.3	+0.0087	0.6011	0.0532	+38	−20
56 Tauri	5.2	+2.32	+ 1.3	+21 34.8	16 38.6	− 3 36.8	−0.6225	0.6012	+0.0531	+ 2	−61
224 B. Tauri	6.1	2.28	1.4	20 37.9	17 44.0	− 2 33.9	+0.3862	0.6014	0.0504	+63	0
227 B. Tauri	5.9	2.28	1.3	20 47.7	18 11.0	− 2 8.0	+0.2446	0.6015	0.0494	+53	− 7
κ Tauri	4.1	2.30	0.8	22 6.6	18 52.4	− 1 28.3	−1.0432	0.6018	0.0477	−27	−68
67 Tauri	5.4	2.30	0.9	22 1.0	18 53.7	− 1 27.0	−0.9480	0.6018	0.0477	−19	−68
247 B. Tauri	5.8	+2.28	+ 0.9	+21 26.4	19 54.7	− 0 28.4	−0.3222	0.6020	+0.0452	+20	−38
129 H¹. Tauri	5.8	2.22	+ 0.5	20 31.4	23 54.4	+ 3 21.6	+0.7601	0.6029	0.0354	+90	+23
ι Tauri	4.7	2.14	− 1.1	21 28.5	**23** 9 30.0	−11 26.0	+0.0304	0.6041	0.0117	+40	−15
330 B. Tauri	6.3	2.13	1.1	21 9.9	9 59.7	−10 57.6	+0.3473	0.6042	0.0105	+60	+ 2
l Tauri	5.2	2.10	1.1	20 18.7	11 20.4	− 9 40.0	+1.2160	0.6044	0.0071	+89	+60
105 Tauri	6.0	+2.12	− 1.4	+21 35.9	11 22.0	− 9 38.5	−0.0761	0.6043	+0.0070	+33	−21
108 Tauri	6.2	2.10	1.9	22 11.6	14 16.2	− 6 51.4	−0.6634	0.6043	−0.0002	0	−61
n Tauri	5.1	2.09	2.2	22 0.8	15 44.8	− 5 26.3	−0.4863	0.6043	0.0039	+10	−46
o Tauri	4.8	2.05	2.5	21 52.1	18 58.8	− 2 20.2	−0.3663	0.6042	0.0120	+17	−38
372 B. Tauri	6.1	2.01	2.5	20 25.0	21 19.6	− 0 5.1	+1.0575	0.6040	0.0178	+90	+45
ζ Tauri	3.0	+2.00	− 2.9	+21 5.6	22 51.9	+ 1 23.6	+0.3473	0.6039	−0.0216	+60	+ 1

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0. Δα	Red'ns from 1919.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
175 H¹. Tauri	6.5	+2.02	− 3.4	+22 37.2	24 0 33.4	+ 3 0.9	−1.2284	0.6037	−0.0258	−50	−68
χ^1 Orionis	4.5	1.93	3.6	20 15.7	5 22.7	+ 7 38.6	+0.9914	0.6029	0.0377	+90	+38
141 Tauri	6.3	1.94	4.4	22 23.9	8 11.2	+10 20.3	−1.2755	0.6023	0.0445	−65	−68
χ^2 Orionis	4.7	1.90	4.0	20 8.4	9 5.2	+11 12.2	+0.9572	0.6021	0.0467	+90	+35
14 B. Geminorum	6.0	1.92	4.7	22 12.2	11 15.2	−10 43.1	−1.2264	0.6016	0.0519	−49	−68
68 Orionis	5.7	+1.87	− 4.4	+19 48.5	12 15.4	− 9 45.3	+1.1319	0.6013	−0.0543	+90	+48
				NEW	*MOON.*						
19 Sextantis	5.9	+1.61	−12.5	+ 5 0.7	28 20 1.5	− 5 43.4	+1.0789	0.5423	−0.2045	+90	+25
155 B. Leonis	6.5	1.64	12.5	6 6.1	29 1 4.4	− 0 50.1	−1.1035	0.5398	0.2062	−27	−84
237 B. Leonis	6.3	+1.72	−13.5	+ 1 27.1	15 20.0	−11 1.2	+0.8462	0.5334	−0.2087	+90	+ 9
55 Leonis	6.1	1.74	13.5	1 9.9	17 3.6	− 9 20.8	+0.7897	0.5328	0.2087	+90	+ 6
p^3 Leonis	6.1	1.76	13.7	0 25.9	21 0.9	− 5 30.7	+0.7450	0.5314	0.2087	+90	+ 3
p^5 Leonis	5.3	1.80	13.7	+ 0 22.1	30 2 6.5	− 0 34.5	−0.2482	0.5296	0.2083	+24	−52
388 B. Leonis	6.3	1.86	14.0	− 1 15.5	9 15.3	+ 6 21.3	+0.0030	0.5275	0.2071	+38	−38
e Leonis	5.1	+1.87	−14.3	− 2 33.6	10 29.0	+ 7 32.8	+1.1437	0.5272	−0.2068	+88	+30
431 B. Leonis	6.2	1.90	14.1	1 59.5	14 35.8	+11 32.2	−0.3129	0.5262	0.2056	+21	−56
78 B. Virginis	6.5	2.08	14.4	5 16.4	31 8 58.2	+ 5 21.8	−0.4933	0.5231	0.1978	+10	−69
χ Virginis	4.8	+2.24	−14.6	− 7 33.2	21 50.1	− 6 9.2	−0.5145	0.5224	−0.1897	+ 8	−71

AUGUST.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	Y	x′	y′	N.	S.
ψ Virginis	5.0	+2.34	−14.6	− 9 6.2	1 5 36.5	+ 1 23.4	−0.2794	0.5224	−0.1839	+20	−54
49 Virginis	5.2	2.43	14.5	10 18.7	12 34.1	+ 8 8.7	−0.2190	0.5228	0.1780	+22	−50
50 Virginis	6.2	2.43	14.3	9 54.1	13 31.6	+ 9 4.4	−0.8381	0.5229	0.1772	−12	−90
α Virginis (*Spica*)	1.2	+2.54	−14.0	−10 44.6	21 26.3	− 7 15.0	−1.2917	0.5237	−0.1698	−53	−87
i Virginis	5.7	2.56	14.5	12 17.4	22 12.8	− 6 29.9	+0.2751	0.5238	0.1690	+49	−23
550 B. Virginis	6.0	2.62	14.3	12 48.2	2 2 16.3	− 2 33.6	+0.1610	0.5244	0.1649	+42	−29
621 B. Virginis	6.4	2.84	13.4	14 35.2	17 22.2	−11 54.9	−0.2423	0.5272	0.1481	+18	−52
214 G. Virginis	6.5	2.87	13.8	15 57.1	17 45.0	−11 32.9	+1.2074	0.5273	0.1476	+75	+40
40 H. Virginis	5.1	+2.91	−13.5	−15 55.4	20 34.6	− 8 48.4	+0.7637	0.5279	−0.1442	+75	+ 5
ι Libræ	4.7	3.39	10.7	19 29.3	4 2 57.4	− 3 21.9	+0.9385	0.5363	0.1022	+71	+18
25 Libræ	6.0	3.40	10.5	19 20.8	3 29.6	− 2 50.6	+0.7256	0.5364	0.1014	+71	+ 4
28 Libræ	6.2	3.42	9.5	17 52.1	7 11.7	+ 0 44.5	−1.2740	0.5376	0.0957	−62	−81
147 B. Libræ	6.2	3.54	9.5	20 27.2	11 51.7	+ 5 15.6	+1.1554	0.5390	0.0883	+70	+37
150 B. Libræ	6.1	+3.53	− 9.2	−19 53.5	12 24.7	+ 5 47.6	+0.4856	0.5392	−0.0874	+53	−10
11 H. Libræ	5.4	3.52	9.0	19 23.9	12 50.8	+ 6 12.9	−0.0976	0.5393	0.0867	+18	−43
172 B. Libræ	5.9	3.60	9.0	20 45.1	15 32.9	+ 8 50.0	+1.1703	0.5402	0.0823	+70	+39
41 Libræ	5.3	3.56	8.4	19 2.3	15 52.8	+ 9 9.1	−0.7507	0.5402	0.0818	−18	−90
κ Libræ	5.0	3.58	8.3	19 25.2	17 20.3	+10 33.8	−0.4468	0.5407	0.0794	− 2	−67
λ Libræ	5.1	+3.67	− 7.4	−19 55.7	22 46.8	− 8 10.2	−0.2915	0.5424	−0.0702	+ 6	−56
47 Libræ	5.8	3.66	7.0	19 8.8	23 35.4	− 7 23.1	−1.2112	0.5426	0.0689	−55	−90
10 G. Scorpii	5.9	3.72	7.3	20 45.1	5 0 50.3	− 6 10.6	+0.4765	0.5430	0.0667	+51	−11
β Scorpii	2.9	3.73	6.2	19 35.2	4 32.6	− 2 35.5	−1.0449	0.5441	0.0603	−40	−90
56 B. Scorpii	5.0	3.73	6.2	19 35.0	4 32.8	− 2 35.3	−1.0493	0.5441	0.0603	−41	−90
ω^1 Scorpii	4.3	+3.76	− 6.4	−20 27.2	5 10.9	− 1 58.3	−0.1267	0.5443	−0.0593	+14	−45
ω^2 Scorpii	4.6	3.78	6.4	20 39.2	5 27.6	− 1 42.2	+0.0778	0.5444	0.0588	+25	−33
84 B. Scorpii	6.3	3.82	5.8	20 54.3	8 48.4	+ 1 32.0	+0.1685	0.5453	0.0529	+30	−28
51 G. Scorpii	6.5	3.84	5.7	21 6.3	9 59.0	+ 2 40.3	+0.3287	0.5457	0.0508	+39	−19
58 G. Scorpii	6.2	3.83	5.1	20 1.4	11 0.7	+ 3 40.1	−0.9162	0.5460	0.0490	−32	−90
ψ Ophiuchi	4.6	+3.85	− 4.6	−19 51.0	13 21.5	+ 5 56.3	−1.2160	0.5466	−0.0448	−58	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

	The Star's					At Conjunction in R. A.					Limiting Parallels.	
	Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
			$\Delta\alpha$	$\Delta\delta$								
			s	″	° ′	d h m	h m				°	°
ω	Ophiuchi	4.5	+3.94	− 4.3	−21 17.7	**5** 17 6.3	+ 9 33.7	+0.2220	0.5477	−0.0380	+31	−25
123 B.	Scorpii	6.5	3.95	3.1	20 15.1	21 4.2	−10 36.2	−1.0624	0.5487	0.0307	−45	−90
68 B.	Ophiuhci	5.9	4.02	1.9	20 16.9	**6** 3 3.4	− 4 48.9	−1.1795	0.5503	0.0196	−56	−90
109 B.	Ophiuchi	6.2	4.08	0.8	20 22.9	8 18.7	+ 0 16.0	−1.1449	0.5514	0.0097	−54	−90
116 B.	Ophiuchi	6.3	4.12	− 1.0	21 27.2	8 57.7	+ 0 53.7	+0.0258	0.5516	−0.0085	+17	−36
ξ	Ophiuchi	4.4	+4.19	+ 0.5	−21 1.6	15 47.8	+ 7 30.0	−0.4558	0.5530	+0.0045	− 9	−68
190 B.	Ophiuchi	5.9	4.20	0.9	21 22.0	17 30.2	+ 9 9.1	−0.0726	0.5533	0.0078	+12	−42
52	Ophiuchi	6.4	4.27	1.8	21 59.4	22 22.2	−10 8.7	+0.6686	0.5542	0.0171	+62	+ 1
58	Ophiuchi	4.8	4.29	2.8	21 38.6	**7** 2 6.3	− 6 32.2	+0.3679	0.5547	0.0243	+39	−17
16 G.	Sagittarii	6.4	4.31	4.8	20 20.0	9 42.5	+ 0 48.6	−0.8211	0.5557	0.0389	−27	−90
30 G.	Sagittarii	6.2	+4.37	+ 5.3	−21 27.1	12 58.4	+ 3 57.9	+0.5338	0.5561	+0.0451	+53	− 7
39 G.	Sagittarii	6.3	4.34	6.1	19 51.4	14 51.1	+ 5 46.8	−1.1117	0.5562	0.0487	−47	−90
μ	Sagittarii	4.0	4.38	6.1	21 4.8	15 58.8	+ 6 52.2	+0.2731	0.5563	0.0509	+36	−22
14	Sagittarii	5.6	4.40	6.0	21 44.0	16 12.0	+ 7 5.0	+0.9956	0.5564	0.0513	+69	+23
15	Sagittarii	5.3	4.38	6.3	20 45.1	16 38.9	+ 7 30.9	−0.0488	0.5564	0.0522	+17	−41
16	Sagittarii	5.9	+4.37	+ 6.4	−20 24.7	16 39.3	+ 7 31.3	−0.4179	0.5564	+0.0522	− 2	−65
21	Sagittarii	5.0	4.40	7.4	20 35.0	21 16.5	+11 59.2	+0.0312	0.5568	0.0610	+23	−36
121 B.	Sagittarii	5.9	4.45	8.6	21 7.0	**8** 3 26.7	− 6 3.0	+1.0196	0.5570	0.0726	+69	+25
128 B.	Sagittarii	6.3	4.47	9.3	21 4.9	6 22.1	− 3 13.7	+1.2007	0.5571	0.0780	+69	+44
29	Sagittarii	5.3	4.46	9.9	20 24.9	8 22.0	− 1 17.7	+0.6389	0.5571	0.0817	+64	− 1
171 B.	Sagittarii	6.1	+4.46	+11.4	−19 21.6	14 29.6	+ 4 37.4	+0.0364	0.5571	+0.0929	+26	−36
173 B.	Sagittarii	6.4	4.45	11.5	19 13.1	14 31.2	+ 4 39.0	−0.1153	0.5571	0.0929	+18	−45
187 B.	Sagittarii	6.4	4.45	11.9	18 51.6	16 21.7	+ 6 25.7	−0.3249	0.5571	0.0962	+ 7	−58
190 B.	Sagittarii	5.4	4.47	11.9	19 24.9	16 52.3	+ 6 55.3	+0.3205	0.5570	0.0972	+43	−20
195 B.	Sagittarii	6.3	4.48	12.0	19 55.7	17 33.6	+ 7 35.2	+0.9402	0.5570	0.0984	+71	+18
d	Sagittarii	5.0	+4.47	+12.9	−19 5.7	21 9.0	+11 3.3	+0.4076	0.5569	+0.1047	+49	−15
226 B.	Sagittarii	6.4	4.48	13.3	19 23.0	22 57.9	−11 11.4	+0.9097	0.5568	0.1079	+71	+16
ρ	Sagittarii	4.0	4.44	13.5	17 59.8	23 0.7	−11 8.8	−0.5720	0.5568	0.1080	− 5	−78
45	Sagittarii	6.0	4.46	13.4	18 27.3	23 4.8	−11 4.8	−0.0728	0.5568	0.1081	+22	−42
266 B.	Sagittarii	6.1	4.49	14.7	19 1.7	**9** 5 44.9	− 4 38.3	+1.2982	0.5564	0.1195	+71	+62
267 B.	Sagittarii	5.8	+4.47	+14.8	−18 24.5	6 2.5	− 4 21.2	+0.6694	0.5565	+0.1200	+70	0
54	Sagittarii	5.4	4.43	15.4	16 28.5	7 44.8	− 2 42.4	−1.1885	0.5564	0.1229	−47	−90
e	Sagittarii	5.2	4.43	15.6	16 18.6	8 34.3	− 1 54.6	−1.2626	0.5562	0.1242	−57	−86
g	Sagittarii	5.1	4.42	17.0	15 42.1	15 39.8	+ 4 56.7	−0.9858	0.5557	0.1356	−28	−90
16 B.	Capricorni	6.2	4.41	19.0	15 2.1	**10** 2 10.9	− 8 53.3	−0.1797	0.5547	0.1515	+21	−48
β	Capricorni	3.2	+4.42	+19.1	−15 2.0	2 17.4	− 8 47.0	−0.1665	0.5547	+0.1517	+21	−47
27 G.	Capricorni	6.2	4.41	19.7	15 19.4	6 56.1	− 4 17.7	+0.8598	0.5542	0.1582	+75	+11
45 B.	Capricorni	6.1	4.39	20.2	13 59.7	8 23.5	− 2 53.2	−0.3120	0.5540	0.1602	+14	−57
84 B.	Capricorni	6.0	4.37	21.4	12 50.4	16 3.0	+ 4 31.0	−0.2641	0.5532	0.1702	+18	−53
16 B.	Aquarii	6.4	4.34	21.6	11 52.5	17 10.5	+ 5 36.3	−1.0872	0.5531	0.1716	−31	−90
ν	Aquarii	4.5	+4.33	+22.6	−11 41.6	**11** 0 50.8	−10 58.8	+0.0770	0.5523	+0.1807	+38	−33
51 G.	Aquarii	6.5	4.31	22.8	10 56.1	3 2.4	− 8 51.5	−0.3202	0.5522	0.1831	+17	−57
17	Aquarii	6.3	4.28	23.4	9 39.5	7 5.4	− 4 56.5	−0.9046	0.5517	0.1873	−16	−90
19	Aquarii	5.6	4.28	23.4	10 5.3	8 8.9	− 3 55.1	−0.2572	0.5517	0.1884	+21	−53
ξ	Aquarii	4.8	4.25	24.1	8 12.7	14 0.9	+ 1 45.3	−1.0931	0.5512	0.1939	−29	−90
c^1	Capricorni	5.3	+4.25	+24.5	− 9 26.9	17 24.0	+ 5 1.7	+0.8577	0.5510	+0.1969	+81	+10
c^2	Capricorni	6.3	4.25	24.6	9 38.6	17 59.4	+ 5 36.0	+1.1774	0.5510	0.1974	+81	+34
30	Aquarii	5.6	4.19	25.1	6 54.4	**12** 1 58.2	−10 41.1	−0.0696	0.5506	0.2035	+32	−42
138 B.	Aquarii	6.4	4.15	25.2	5 6.8	6 24.9	− 6 23.1	−1.0183	0.5505	0.2063	−22	−90
44	Aquarii	5.7	4.15	25.5	5 47.1	8 27.5	− 4 24.6	+0.1007	0.5505	0.2075	+42	−32
51	*Aquarii*	5.8	+4.14	+25.6	− 5 14.4	11 44.5	− 1 14.1	+0.2209	0.5505	+0.2093	+50	−26

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
187 B. Aquarii	6.3	+4.11	+25.5	− 3 19.2	12 15 7.2	+ 2 2.0	−1.0544	0.5506	+0.2110	−24	−90
κ Aquarii	5.2	4.10	25.8	4 38.3	18 8.0	+ 4 56.9	+0.9462	0.5507	0.2122	+86	+16
207 B. Aquarii	6.3	4.09	25.8	3 58.1	19 33.5	+ 6 19.5	+0.5566	0.5507	0.2127	+73	− 8
6 G. Piscium	6.2	4.05	25.9	2 49.3	13 3 43.2	− 9 46.9	+1.1203	0.5512	0.2151	+88	+29
3 Piscium	6.3	4.04	25.6	0 14.5	4 50.0	− 8 42.2	−1.2938	0.5513	0.2153	−47	−90
22 B. Piscium	6.4	+3.98	+25.6	− 0 8.8	15 29.0	+ 1 35.6	+0.9073	0.5526	+0.2161	+90	+13
κ Piscium	4.9	3.98	25.4	+ 0 49.1	17 3.6	+ 3 7.1	+0.2584	0.5528	0.2161	+53	−24
9 Piscium	6.4	3.98	25.4	0 41.1	17 12.4	+ 3 15.5	+0.4280	0.5529	0.2160	+64	−14
16 Piscium	5.7	3.95	25.2	1 39.6	21 26.6	+ 7 21.3	+0.3435	0.5536	0.2156	+58	−19
λ Piscium	4.6	3.93	25.1	1 20.5	14 0 3.3	+ 9 52.7	+1.2313	0.5541	0.2151	+90	+40
19 Piscium	5.4	+3.93	+24.8	+ 3 2.7	2 3.2	+11 48.6	−0.0810	0.5545	+0.2147	+33	−42
22 Piscium	5.8	3.91	24.8	2 29.2	4 36.7	− 9 43.0	+1.0369	0.5550	0.2140	+90	+22
51 Piscium	5.6	3.82	22.9	6 30.9	23 0.2	+ 8 3.1	+0.7923	0.5600	0.2052	+90	+ 8
136 B. Piscium	6.5	3.81	21.9	8 55.2	15 2 57.5	+11 52.3	−0.8482	0.5613	0.2024	−10	−82
π Piscium	5.6	3.66	18.5	11 44.0	16 3 33.8	+11 36.8	+0.9961	0.5706	0.1776	+90	+24
19 Arietis	5.8	+3.59	+15.3	+14 54.3	18 54.3	+ 2 24.0	+0.3456	0.5772	+0.1559	+59	−12
27 Arietis	6.4	3.56	13.2	17 21.0	17 2 23.1	+ 9 36.3	−1.0085	0.5804	0.1437	−22	−73
36 Arietis	6.5	3.51	12.2	17 25.5	7 57.7	− 9 1.6	−0.3104	0.5827	0.1339	+20	−46
40 Arietis	6.0	3.50	11.8	17 57.0	9 42.0	− 7 21.1	−0.6121	0.5834	0.1307	+ 4	−66
π Arietis	5.2	3.48	12.0	17 7.9	10 1.4	− 7 2.5	+0.2587	0.5835	0.1301	+53	−14
45 Arietis	6.0	+3.47	+11.2	+18 0.4	12 42.0	− 4 27.9	−0.2860	0.5846	+0.1251	+22	−43
ρ Arietis	5.6	3.47	11.2	17 42.2	12 57.0	− 4 13.5	+0.0523	0.5847	0.1246	+41	−24
53 Arietis	6.0	3.41	10.6	17 34.3	17 28.2	+ 0 7.5	+0.7308	0.5865	0.1159	+90	+14
54 Arietis	6.5	3.42	10.2	18 29.3	17 50.2	+ 0 28.6	−0.1548	0.5866	0.1152	+29	−35
δ Arietis	4.5	3.44	9.6	19 25.4	19 9.6	+ 1 44.9	−0.9513	0.5871	0.1126	−19	−71
175 B. Arietis	6.4	+3.35	+ 8.7	+18 28.6	18 1 26.6	+ 7 47.5	+0.6755	0.5893	+0.0998	+90	+12
14 H^1. Tauri	6.5	3.34	7.0	20 39.3	6 14.6	−11 35.6	−1.0746	0.5909	0.0896	−29	−70
13 Tauri	5.6	3.29	7.2	19 26.6	7 35.5	−10 17.8	+0.2701	0.5913	0.0867	+54	− 9
14 Tauri	6.2	3.29	7.1	19 24.7	8 10.8	− 9 43.9	+0.3529	0.5915	0.0855	+60	− 4
22 H^1. Tauri	6.1	3.31	6.6	20 40.5	8 26.5	− 9 28.7	−0.9041	0.5916	0.0849	−16	−70
43 Tauri	5.5	+3.17	+ 5.2	+19 23.8	18 20.2	+ 0 1.9	+1.1222	0.5941	+0.0629	+90	+47
ω Tauri	4.8	3.15	4.3	20 22.9	21 33.2	+ 3 7.3	+0.3160	0.5947	0.0555	+57	− 3
51 Tauri	5.6	3.17	3.8	21 23.0	21 59.0	+ 3 32.2	−0.6752	0.5948	0.0545	− 1	−65
53 Tauri	5.3	3.15	3.9	20 56.9	22 24.5	+ 3 56.7	−0.2117	0.5949	0.0536	+25	−32
56 Tauri	5.2	3.17	3.7	21 34.8	22 28.2	+ 4 0.2	−0.8480	0.5949	0.0534	−12	−69
224 B. Tauri	6.1	+3.13	+ 3.8	+20 37.9	23 35.0	+ 5 4.4	+0.1702	0.5951	+0.0508	+48	−10
227 B. Tauri	5.9	3.13	3.6	20 47.7	19 0 2.5	+ 5 30.8	+0.0279	0.5951	0.0498	+39	−18
κ Tauri	4.1	3.15	3.0	22 6.6	0 44.9	+ 6 11.5	−1.2701	0.5953	0.0481	−60	−68
67 Tauri	5.4	3.15	3.1	22 1.0	0 46.1	+ 6 12.7	−1.1740	0.5953	0.0481	−41	−68
247 B. Tauri	5.8	3.13	3.0	21 26.4	1 48.4	+ 7 12.5	−0.5420	0.5955	0.0456	+ 7	−53
129 H^1. Tauri	5.8	+3.05	+ 2.6	+20 31.4	5 53.3	+11 7.9	+0.5542	0.5960	+0.0361	+77	+12
ι Tauri	4.7	2.95	0.5	21 28.5	15 42.2	− 3 26.4	−0.1709	0.5966	0.0128	+28	−26
330 B. Tauri	6.3	2.93	0.5	21 9.9	16 12.6	− 2 57.2	+0.1499	0.5966	0.0116	+47	− 9
l Tauri	5.2	2.89	0.5	20 18.8	17 35.3	− 1 37.8	+1.0290	0.5966	0.0083	+90	+44
105 Tauri	6.0	2.92	+ 0.1	21 35.9	17 36.9	− 1 36.2	−0.2760	0.5966	0.0082	+22	−32
108 Tauri	6.2	+2.90	− 0.7	+22 11.6	20 35.4	+ 1 15.3	−0.8656	0.5965	+0.0011	−14	−68
n Tauri	5.1	2.88	0.9	22 0.8	22 6.2	+ 2 42.4	−0.6847	0.5965	−0.0025	− 2	−63
o Tauri	4.8	2.83	1.4	21 52.1	20 1 25.1	+ 5 53.6	−0.5590	0.5962	0.0104	+ 6	−52
372 B. Tauri	6.1	2.77	1.4	20 25.0	3 49.5	+ 8 12.3	+0.8833	0.5960	0.0162	+90	+33
ζ Tauri	3.0	2.76	1.9	21 5.6	5 24.2	+ 9 43.4	+0.1678	0.5958	0.0199	+48	− 8
χ^1 Orionis	4.5	+2.65	− 2.8	+20 15.7	12 5.1	− 7 51.4	+0.8290	0.5947	−0.0356	+90	+28

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
64 Orionis	5.1	+2.61	- 3.2	+19 41.5	**20** 15 42.7	- 4 22.3	+1.2649	0.5939	-0.0440	+78	+66
χ^2 Orionis	4.7	2.61	3.4	20 8.4	15 53.5	- 4 12.0	+0.8004	0.5939	0.0444	+90	+25
68 Orionis	5.7	2.57	3.8	19 48.5	19 8.6	- 1 4.5	+0.9823	0.5930	0.0518	+90	+37
15 Geminorum	6.5	2.51	5.1	20 50.3	**21** 1 28.6	+ 5 0.8	-0.4409	0.5912	0.0661	+13	-48
16 Geminorum	6.2	2.50	5.0	20 32.7	1 32.9	+ 5 5.0	-0.1456	0.5912	0.0662	+29	-29
ν Geminorum	4.1	+2.49	- 5.0	+20 15.8	1 57.8	+ 5 28.9	+0.1137	0.5911	-0.0671	+44	-15
162 B. Geminorum	5.7	2.17	7.9	17 15.5	**22** 3 54.0	+ 6 26.4	+0.7451	0.5801	0.1198	+90	+14
f Geminorum	5.3	2.15	8.3	17 51.5	7 7.9	+ 9 33.3	-0.2676	0.5785	0.1256	+23	-42
1 Cancri	6.0	2.06	8.8	16 0.3	14 37.6	- 7 13.4	+0.6473	0.5746	0.1384	+86	+ 7
2 B. Cancri	6.0	2.06	9.0	16 44.1	15 16.5	- 6 35.9	-0.1946	0.5743	0.1395	+27	-40
3 Cancri	5.7	+2.06	- 9.2	+17 31.7	16 14.4	- 5 40.1	-1.1469	0.5738	-0.1410	-35	-73
5 Cancri	5.9	2.05	9.1	16 40.6	16 33.5	- 5 21.7	-0.3150	0.5736	0.1415	+20	-47
30 B. Cancri	6.1	2.00	9.2	+14 52.0	20 41.0	- 1 23.1	+0.9530	0.5713	0.1480	+90	+25
				NEW	*MOON.*						
78 B. Virginis	6.5	+1.90	-12.8	- 5 16.3	**27** 17 20.7	- 8 27.8	-0.2879	0.5271	-0.1975	+21	-54
χ Virginis	4.8	2.00	12.8	7 33.2	**28** 6 5.5	+ 3 54.0	-0.2875	0.5264	0.1896	+20	-54
ψ Virginis	5.0	2.08	12.7	9 6.2	13 47.6	+11 22.3	-0.0417	0.5264	0.1838	+33	-40
49 Virginis	5.2	2.15	12.6	10 18.7	20 41.4	- 5 56.3	+0.0278	0.5267	0.1780	+36	-36
50 Virginis	6.2	2.16	12.4	9 54.1	21 38.4	- 5 0.9	-0.5887	0.5267	0.1772	+ 2	-78
α Virginis (*Spica*)	1.2	+2.24	-12.1	-10 44.5	**29** 5 29.1	+ 2 35.6	-1.0322	0.5273	-0.1698	-26	-90
i Virginis	5.7	2.26	12.5	12 17.4	6 15.3	+ 3 20.4	+0.5319	0.5274	0.1690	+66	- 8
550 B. Virginis	6.0	2.30	12.3	12 48.2	10 16.8	+ 7 14.7	+0.4223	0.5278	0.1649	+58	-14
621 B. Virginis	6.4	2.49	11.5	14 35.2	**30** 1 16.6	- 2 12.8	+0.0325	0.5299	0.1480	+33	-36
40 H. Virginis	5.1	2.54	11.6	15 55.4	4 28.0	+ 0 52.7	+1.0390	0.5304	0.1441	+75	+25
ι Libræ	4.7	+2.97	- 9.2	-19 29.3	**31** 10 46.8	+ 6 15.5	+1.2257	0.5367	-0.1021	+71	+46
25 Libræ	6.0	2.97	9.0	19 20.7	11 19.1	+ 6 46.7	+1.0128	0.5368	0.1013	+71	+24
26 Libræ	6.3	2.95	8.4	17 28.1	11 56.8	+ 7 23.3	-1.1261	0.5369	0.1003	-43	-90
28 Libræ	6.2	2.99	8.0	17 52.0	15 1.5	+10 22.2	-0.9872	0.5376	0.0956	-32	-90
150 B. Libræ	6.1	3.10	7.9	19 53.4	20 15.2	- 8 34.1	+0.7729	0.5388	0.0873	+71	+ 7
11 H. Libræ	5.4	+3.10	- 7.7	-19 23.8	20 41.3	- 8 8.8	+0.1893	0.5389	-0.0866	+35	-27
41 Libræ	5.3	+3.14	- 7.1	-19 2.3	23 43.9	- 5 12.0	-0.4648	0.5396	-0.0817	- 2	-68

SEPTEMBER.

κ Libræ	5.0	+3.16	- 7.1	-19 25.1	**1** 1 11.8	- 3 46.9	-0.1610	0.5400	-0.0793	+15	-47
λ Libræ	5.1	3.24	6.3	19 55.7	6 39.8	+ 1 30.6	-0.0069	0.5412	0.0702	+22	-38
47 Libræ	5.8	3.23	5.9	19 8.8	7 28.6	+ 2 17.8	-0.9279	0.5414	0.0689	-31	-90
10 G. Scorpii	5.9	3.29	6.2	20 45.0	8 44.0	+ 3 30.8	+0.7616	0.5417	0.0668	+70	+ 8
β Scorpii	2.9	3.30	5.2	19 35.2	12 27.6	+ 7 7.2	-0.7633	0.5425	0.0604	-21	-90
56 B. Scorpii	5.0	+3.30	- 5.2	-19 34.9	12 27.8	+ 7 7.4	-0.7678	0.5425	-0.0604	-21	-90
ω^1 Scorpii	4.3	3.34	5.4	20 27.1	13 6.0	+ 7 44.5	+0.1562	0.5427	0.0593	+30	-29
ω^2 Scorpii	4.6	3.35	5.5	20 39.2	13 22.9	+ 8 0.8	+0.3609	0.5427	0.0588	+42	-17
84 B. Scorpii	6.3	3.39	5.0	20 54.2	16 45.0	+11 16.4	+0.4503	0.5434	0.0530	+48	-12
51 G. Scorpii	6.5	3.41	4.8	21 6.3	17 56.1	-11 34.9	+0.6104	0.5437	0.0509	+59	- 3
58 G. Scorpii	6.2	+3.40	- 4.2	-20 1.3	18 58.3	-10 34.6	-0.6375	0.5440	-0.0492	-15	-86
ψ Ophiuchi	4.6	3.42	3.8	19 51.0	21 20.2	- 8 17.3	-0.9392	0.5444	0.0450	-34	-90
ω Ophiuchi	4.5	3.51	3.6	21 17.7	**2** 1 6.8	- 4 38.1	+0.4998	0.5452	0.0383	+50	- 9
123 B. Scorpii	6.5	3.53	2.4	20 15.1	5 6.8	- 0 46.0	-0.7900	0.5461	0.0311	-26	-90
68 B. Ophiuchi	5.9	3.61	1.4	20 16.9	11 9.4	+ 5 4.8	-0.9117	0.5472	0.0202	-34	-90
109 B. Ophiuchi	6.2	+3.68	- 0.4	-20 22.9	16 28.0	+10 13.0	-0 8814	0.5482	-0.0104	-33	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
B. Ophiuchi	6.3	+3.71	− 0.6	−21 27.2	2 17 7.4	+10 51.1	+0.2922	0.5483	−0.0092	+33	−21
Ophiuchi	4.4	3.80	+ 0.8	21 1.6	3 0 1.9	− 6 28.0	−0.1969	0.5493	+0.0036	+ 5	−49
B. Ophiuchi	5.9	3.81	1.1	21 22.0	1 45.6	− 4 47.7	+0.1860	0.5496	0.0068	+26	−27
Ophiuchi	6.4	3.89	2.0	21 59.4	6 40.9	− 0 2.2	+0.9246	0.5503	0.0160	+69	+18
Ophiuchi	4.8	3.92	2.8	21 38.6	10 27.7	+ 3 37.1	+0.6190	0.5508	0.0231	+58	− 2
G. Sagittarii	6.4	+3.96	+ 4.9	−20 20.0	18 9.4	+11 3.5	−0.5826	0.5516	+0.0374	−14	−80
G. Sagittarii	6.2	4.03	5.2	21 27.1	21 27.7	− 9 44.9	+0.7727	0.5520	0.0436	+69	+ 7
G. Sagittarii	6.3	4.00	6.1	19 51.4	23 21.7	− 7 54.7	−0.8805	0.5521	0.0471	−30	−90
Sagittarii	4.0	4.05	6.0	21 4.8	4 0 30.3	− 6 48.4	+0.5074	0.5523	0.0493	+52	− 9
Sagittarii	5.6	4.07	5.8	21 44.1	0 43.6	− 6 35.6	+1.2319	0.5523	0.0497	+69	+50
Sagittarii	5.3	+4.04	+ 6.2	−20 45.1	1 10.9	− 6 9.2	+0.1836	0.5523	+0.0505	+30	−27
Sagittarii	5.9	4.04	6.3	20 24.7	1 11.3	− 6 8.8	−0.1867	0.5523	0.0505	+10	−49
Sagittarii	5.0	4.08	7.2	20 35.0	5 51.8	− 1 37.6	+0.2576	0.5527	0.0592	+36	−23
B. Sagittarii	5.9	4.16	8.3	21 7.0	12 6.3	+ 4 24.4	+1.2401	0.5530	0.0706	+69	+50
Sagittarii	5.3	4.18	9.7	20 24.9	17 4.9	+ 9 13.0	+0.8507	0.5532	0.0796	+70	+12
B. Sagittarii	6.1	+4.20	+11.2	−19 21.7	23 16.4	− 8 48.0	+0.2367	0.5534	+0.0906	+38	−24
B. Sagittarii	6.4	4.20	11.3	19 13.1	23 18.0	− 8 46.4	+0.0846	0.5534	0.0907	+29	−33
B. Sagittarii	6.4	4.21	11.7	18 51.6	5 1 9.6	− 6 58.5	−0.1286	0.5534	0.0940	+17	−45
B. Sagittarii	5.4	4.22	11.7	19 24.9	1 40.6	− 6 28.5	+0.5175	0.5535	0.0949	+56	− 8
B. Sagittarii	6.3	4.24	11.7	19 55.7	2 22.2	− 5 48.3	+1.1375	0.5535	0.0961	+71	+35
Sagittarii	5.0	+4.24	+12.7	−19 5.7	5 59.7	− 2 18.1	+0.5973	0.5535	+0.1024	+63	− 4
B. Sagittarii	6.4	4.27	13.0	19 23.0	7 49.6	− 0 31.8	+1.0972	0.5536	0.1055	+71	+31
Sagittarii	4.0	4.23	13.4	17 59.8	7 52.4	− 0 29.0	−0.3875	0.5536	0.1056	+ 5	−62
Sagittarii	6.0	4.25	13.2	18 27.3	7 56.6	− 0 25.2	+0.1126	0.5536	0.1057	+32	−31
B. Sagittarii	5.8	4.29	14.6	18 24.5	14 57.7	+ 6 22.0	+0.8432	0.5536	0.1175	+72	+11
Sagittarii	5.4	+4.25	+15.5	−16 28.5	16 40.8	+ 8 1.5	−1.0206	0.5536	+0.1203	−32	−90
Sagittarii	5.2	4.25	15.7	16 18.6	17 30.6	+ 8 49.7	−1.0963	0.5536	0.1217	−38	−90
Sagittarii	5.1	4.28	17.1	15 42.1	6 0 38.8	− 8 16.4	−0.8324	0.5535	0.1331	−18	−90
B. Capricorni	6.2	4.32	19.2	15 2.1	11 12.3	+ 1 55.9	−0.0477	0.5534	0.1490	+27	−40
Capricorni	3.2	4.32	19.2	15 2.0	11 18.9	+ 2 2.4	−0.0347	0.5533	0.1491	+28	−39
G. Capricorni	6.2	+4.34	+19.8	−15 19.4	15 58.2	+ 6 32.3	+0.9806	0.5533	+0.1557	+75	+20
B. Capricorni	6.1	4.32	20.5	13 59.7	17 25.6	+ 7 56.8	−0.1933	0.5533	0.1578	+21	−49
B. Capricorni	6.0	4.34	21.9	12 50.4	7 1 4.9	− 8 39.1	−0.1627	0.5532	0.1679	+23	−48
B. Aquarii	6.4	4.32	22.2	11 52.4	2 12.4	− 7 33.8	−0.9867	0.5532	0.1693	−24	−90
Aquarii	4.5	4.35	23.3	11 41.6	9 51.2	− 0 10.3	+0.1568	0.5532	0.1785	+42	−28
G. Aquarii	6.5	+4.33	+23.7	−10 56.1	12 2.2	+ 1 56.3	−0.2445	0.5532	+0.1810	+20	−52
Aquarii	6.3	4.32	24.4	9 39.5	16 3.9	+ 5 49.9	−0.8366	0.5533	0.1854	−13	−90
Aquarii	5.6	4.33	24.3	10 5.2	17 7.0	+ 6 51.0	−0.1941	0.5534	0.1865	+24	−49
Aquarii	4.8	4.32	25.3	8 12.7	22 56.3	−11 31.3	−1.0407	0.5535	0.1922	−25	−90
Capricorni	5.3	4.34	25.6	9 26.9	8 2 17.5	− 8 16.9	+0.8922	0.5538	0.1953	+81	+13
Capricorni	6.3	+4.35	+25.6	− 9 38.6	2 52.6	− 7 42.9	+1.2089	0.5538	+0.1958	+81	+38
Aquarii	5.6	4.33	26.6	6 54.4	10 45.9	− 0 5.4	−0.0523	0.5543	0.2022	+33	−40
B. Aquarii	6.4	4.31	27.1	5 6.8	15 9.1	+ 4 9.0	−1.0061	0.5546	0.2053	−20	−90
Aquarii	5.7	4.32	27.2	5 47.1	17 10.0	+ 6 5.8	+0.1002	0.5548	0.2066	+41	−32
Aquarii	5.8	4.32	27.4	5 14.4	20 24.0	+ 9 13.4	+0.2111	0.5552	0.2085	+49	−26
B. Aquarii	6.3	+4.31	+27.7	− 3 19.1	23 43.4	−11 33.9	−1.0634	0.5556	+0.2102	−25	−90
Aquarii	5.2	4.32	27.7	4 38.3	9 2 41.2	− 8 42.1	+0.9139	0.5560	0.2116	+86	+14
B. Aquarii	6.3	4.32	27.9	3 58.1	4 5.1	− 7 21.0	+0.5237	0.5562	0.2122	+71	− 9
G. Piscium	6.2	4.32	28.1	2 49.3	12 5.5	+ 0 23.2	+1.0609	0.5575	0.2149	+88	+24
Piscium	6.3	4.31	28.3	0 14.5	13 11.0	+ 1 26.5	−1.3342	0.5577	0.2151	−55	−83
B. Piscium	6.4	+4.31	+28.3	− 0 8.7	23 36.1	+11 30.5	+0.8193	0.5598	+0.2164	+90	+ 8

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
κ Piscium	4.9	+4.31	+28.2	+ 0 49.2	**10** 1 8.5	−11 0.3	+0.1731	0.5602	+0.2164	+47	−28
9 Piscium	6.4	4.31	28.2	0 41.1	1 17.1	−10 52.0	+0.3406	0.5602	0.2164	+58	−19
16 Piscium	5.7	4.30	28.2	1 39.6	5 25.3	− 6 52.2	+0.2465	0.5612	0.2161	+52	−24
λ Piscium	4.6	4.30	28.0	1 20.5	7 58.2	− 4 24.6	+1.1184	0.5619	0.2157	+90	+28
19 Piscium	5.4	4.31	28.0	3 2.7	9 55.1	− 2 31.7	−0.1844	0.5625	0.2154	+27	−48
22 Piscium	5.8	+4.31	+27.9	+ 2 29.3	12 24.8	− 0 7.1	+0.9152	0.5631	+0.2148	+90	+15
51 Piscium	5.6	4.30	26.5	6 30.9	**11** 6 19.3	− 6 50.2	+0.6325	0.5688	0.2063	+81	− 1
136 B. Piscium	6.5	4.31	25.8	8 55.2	10 10.2	− 3 7.4	−0.9964	0.5702	0.2035	−20	−82
π Piscium	5.6	4.28	22.3	11 44.0	**12** 10 7.1	− 4 2.3	+0.7836	0.5794	0.1787	+90	+10
12 H^1. Arietis	6.3	4.25	20.3	13 5.5	20 46.0	+ 6 12.9	+1.2465	0.5835	0:1635	+90	+50
19 Arietis	5.8	+4.28	+19.1	+14 54.4	**13** 1 5.0	+10 22.2	+0.1207	0.5852	+0.1567	+44	−24
27 Arietis	6.4	4.28	17.0	17 21.1	8 23.8	− 6 35.6	−1.2277	0.5878	0.1443	−45	−73
36 Arietis	6.5	4.25	15.9	17 25.6	13 51.5	− 1 20.4	−0.5419	0.5897	0.1344	+ 7	−61
40 Arietis	6.0	4.25	15.4	17 57.1	15 33.8	+ 0 18.0	−0.8424	0.5902	0.1312	−11	−73
π Arietis	5.2	4.23	15.6	17 8.0	15 52.7	+ 0 36.2	+0.0202	0.5903	0.1306	+39	−26
124 B. Arietis	6.4	+4.19	+15.5	+16 9.5	17 27.8	+ 2 7.7	+1.2023	0.5908	+0.1276	+90	+49
45 Arietis	6.0	4.23	14.8	18 0.5	18 30.4	+ 3 7.7	−0.5218	0.5912	0.1256	+ 8	−59
ρ Arietis	5.6	4.23	14.7	17 42.3	18 45.1	+ 3 22.0	−0.1866	0.5912	0.1251	+27	−37
53 Arietis	6.0	4.18	13.9	17 34.3	23 11.5	+ 7 38.1	+0.4830	0.5925	0.1163	+70	+ 0
54 Arietis	6.5	4.20	13.5	18 29.3	23 33.0	+ 7 58.8	−0.3954	0.5926	0.1156	+14	−49
δ Arietis	4.5	+4.22	+13.0	+19 25.5	**14** 0 51.2	+ 9 13.9	−1.1864	0.5930	+0.1129	−41	−71
175 B. Arietis	6.4	4.14	11.8	18 28.6	7 2.3	− 8 49.3	+0.4242	0.5945	0.1000	+65	− 1
13 Tauri	5.6	4.11	10.2	19 26.7	13 6.3	− 2 59.5	+0.0192	0.5957	0.0869	+38	−22
14 Tauri	6.2	4.10	10.0	19 24.8	13 41.2	− 2 26.1	+0.1013	0.5958	0.0856	+43	−17
22 H^1. Tauri	6.1	4.13	9.6	20 40.6	13 56.8	− 2 11.0	−1.1479	0.5959	0.0850	−37	−70
43 Tauri	5.5	+4.00	+ 7.6	+19 23.9	23 44.4	+ 7 13.5	+0.8648	0.5971	+0.0630	+90	+28
ω Tauri	4.8	3.98	6.5	20 22.9	**15** 2 56.0	+10 17.5	+0.0622	0.5973	0.0556	+41	−17
51 Tauri	5.6	4.01	6.1	21 23.0	3 21.6	+10 42.1	−0.9248	0.5973	0.0546	−18	−69
53 Tauri	5.3	3.99	6.1	20 56.9	3 46.9	+11 6.4	−0.4633	0.5974	0.0536	+11	−48
56 Tauri	5.2	4.01	5.9	21 34.8	3 50.6	+11 9.9	−1.0970	0.5974	0.0535	−32	−69
224 B. Tauri	6.1	+3.97	+ 6.0	+20 38.0	4 57.0	−11 46.3	−0.0831	0.5974	+0.0509	+33	−24
227 B. Tauri	5.9	3.97	5.8	20 47.8	5 24.3	−11 20.0	−0.2249	0.5975	0.0499	+25	−32
247 B. Tauri	5.8	3.97	5.2	21 26.5	7 9.6	− 9 38.9	−0.7927	0.5975	0.0458	− 9	−69
282 B. Tauri	6.4	3.88	5.0	19 43.0	10 13.4	− 6 42.3	+1.0778	0.5975	0.0385	+90	+46
129 H^1. Tauri	5.8	3.89	4.5	20 31.5	11 13.4	− 5 44.7	+0.2998	0.5975	0.0362	+56	− 2
ι Tauri	4.7	+3.80	+ 1.9	+21 28.5	21 1.1	+ 3 39.9	−0.4218	0.5968	+0.0130	+13	−42
330 B. Tauri	6.3	3.78	1.9	21 9.9	21 31.5	+ 4 9.0	−0.1015	0.5967	0.0118	+31	−22
l Tauri	5.2	3.74	1.8	20 18.8	22 54.2	+ 5 28.5	+0.7771	0.5965	0.0086	+90	+27
105 Tauri	6.0	3.77	1.4	21 35.9	22 55.8	+ 5 30.1	−0.5264	0.5965	0.0085	+ 7	−49
108 Tauri	6.2	3.75	0.5	22 11.6	**16** 1 54.6	+ 8 21.7	−1.1148	0.5961	+0.0015	−35	−68
n Tauri	5.1	+3.72	+ 0.2	+22 0.8	3 25.6	+ 9 49.2	−0.9337	0.5958	−0.0021	−19	−68
351 B. Tauri	6.2	3.67	+ 0.9	20 3.1	3 26.6	+ 9 50.2	+1.0584	0.5958	0.0021	+90	+47
o Tauri	4.8	3.67	− 0.5	21 52.1	6 45.1	−10 59.1	−0.8072	0.5952	0.0099	−10	−69
372 B. Tauri	6.1	3.60	0.5	20 25.1	9 10.0	− 8 39.9	+0.6367	0.5946	0.0156	+86	+18
ζ Tauri	3.0	3.60	1.2	21 5.6	10 45.2	− 7 8.4	−0.0783	0.5942	0.0192	+33	−21
B. D. +19°1110	6.0	+3.48	− 2.0	+19 50.8	16 40.5	− 1 26.9	+1.0370	0.5926	−0.0329	+90	+43
χ^1 Orionis	4.5	3.47	2.4	20 15.7	17 28.6	− 0 40.6	+0.5879	0.5923	0.0347	+80	+14
57 Orionis	5.8	3.47	2.2	19 44.1	17 42.2	− 0 27.6	+1.1175	0.5923	0.0352	+90	+49
64 Orionis	5.1	3.42	2.9	19 41.5	21 7.9	+ 2 50.2	+1.0275	0.5911	0.0430	+90	+41
χ^2 Orionis	4.7	3.43	3.1	20 8.4	21 18.8	+ 3 0.6	+0.5621	0.5911	0.0434	+77	+11
68 Orionis	5.7	+3.37	− 3.6	+19 48.5	**17** 0 35.7	+ 6 10.0	+0.7472	0.5899	−0.0507	+90	+21

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's						At Conjunction in R. A.					Limiting Parallels.	
	Name.	Mag.	Red'ns from 1919.0. Δα	Red'ns from 1919.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
			s	″	° ′	d h m	h m				°	°
15	Geminorum	6.5	+3.30	− 5.3	+20 50.3	**17** 6 59.7	−11 40.7	−0.6751	0.5874	−0.0646	− 1	−66
16	Geminorum	6.2	3.30	5.2	20 32.7	7 4.1	−11 36.4	−0.3787	0.5874	0.0648	+16	−43
ν	Geminorum	4.1	3.28	5.2	20 15.8	7 29.2	−11 12.3	−0.1181	0.5872	0.0657	+31	−28
110 B.	Geminorum	6.2	3.04	6.9	17 52.2	21 21.8	+ 2 9.0	+1.2287	0.5809	0.0941	+90	+56
162 B.	Geminorum	5.7	2.86	8.8	17 15.4	**18** 9 48.4	− 9 51.8	+0.5467	0.5746	0.1172	+75	+ 4
f	Geminorum	5.3	+2.82	− 9.4	+17 51.5	13 5.7	− 6 41.5	−0.4681	0.5728	−0.1228	+11	−55
1	Cancri	6.0	2.69	9.9	16 0.3	20 43.5	+ 0 39.9	+0.4644	0.5688	0.1353	+69	− 2
2 B.	Cancri	6.0	2.70	10.2	16 44.1	21 23.2	+ 1 18.0	−0.3825	0.5684	0.1364	+16	−51
5	Cancri	5.9	2.68	10.3	16 40.6	22 41.6	+ 2 33.8	−0.5018	0.5677	0.1383	+ 9	−59
30 B.	Cancri	6.1	2.60	10.3	14 52.0	**19** 2 53.8	+ 6 37.2	+0.7823	0.5654	0.1446	+90	+14
29	Cancri	5.9	+2.50	−11.1	+14 28.6	10 46.5	− 9 46.4	+0.0064	0.5611	−0.1556	+38	−30
84 B.	Cancri	6.4	2.47	11.2	13 31.9	13 6.0	− 7 31.7	+0.6264	0.5599	0.1586	+82	+ 3
A^1	Cancri	5.5	2.42	11.4	12 58.1	17 23.8	− 3 22.8	+0.5216	0.5577	0.1638	+72	− 3
A^2	Cancri	5.7	2.39	11.5	12 24.3	19 6.4	− 1 43.6	+0.8294	0.5568	0.1659	+90	+14
60	Cancri	5.7	2.34	11.7	11 56.0	23 14.3	+ 2 16.0	+0.6288	0.5547	0.1705	+82	+ 2
α	Cancri	4.3	+2.34	−11.9	+12 10.1	**20** 0 24.9	+ 3 24.2	+0.1807	0.5541	−0.1718	+48	−23
κ	Cancri	5.1	2.28	11.9	10 59.5	4 43.5	+ 7 34.2	+0.6646	0.5520	0.1763	+86	+ 3
209 B.	Cancri	6.5	2.28	12.2	11 53.5	5 39.7	+ 8 28.5	−0.4447	0.5515	0.1771	+13	−60
222 B.	Cancri	6.3	2.25	12.4	11 50.3	9 26.8	−11 51.8	−1.0664	0.5497	0.1807	−26	−79
ω	Leonis	5.5	2.19	12.3	9 24.4	14 27.9	− 7 0.6	+0.5707	0.5474	0.1850	+77	− 3
h	Leonis	5.2	+2.18	−12.5	+10 4.2	16 7.4	− 5 24.4	−0.4354	0.5466	−0.1863	+14	−61
π	Leonis	4.9	2.07	12.9	8 25.8	**21** 5 42.7	+ 7 44.8	−1.3052	0.5410	0.1954	−51	−82
14	Sextantis	6.3	2.04	12.6	6 0.2	8 55.8	+10 52.0	+0.6312	0.5399	0.1970	+81	− 1
19	Sextantis	5.9	2.01	12.6	+ 5 0.7	11 52.6	−10 16.7	+1.1005	0.5388	0.1984	+90	+29
					NEW	*MOON.*						
550 B.	Virginis	6.0	+2.11	−10.7	−12 48.1	**25** 17 55.6	− 7 18.9	+0.5886	0.5302	−0.1639	+70	− 5
86	Virginis	5.6	2.14	10.2	12 1.4	23 36.5	− 1 48.3	−1.1809	0.5310	0.1578	−41	−90
621 B.	Virginis	6.4	2.23	9.8	14 35.1	**26** 8 52.5	+ 7 10.9	+0.2225	0.5324	0.1472	+43	−25
40 H.	Virginis	5.1	2.27	9.8	15 55.4	12 3.3	+10 15.8	+1.2345	0.5330	0.1433	+75	+45
25	Libræ	6.0	+2.59	− 7.3	−19 20.7	**27** 18 50.3	− 7 54.4	+1.2460	0.5384	−0.1005	+71	+50
26	Libræ	6.3	2.56	6.8	17 28.1	19 27.9	− 7 18.0	−0.8953	0.5386	0.0996	−25	−90
28	Libræ	6.2	2.60	6.5	17 52.0	22 32.6	− 4 19.1	−0.7535	0.5391	0.0949	−17	−90
150 B.	Libræ	6.1	2.69	6.3	19 53.4	**28** 3 46.5	+ 0 44.8	+1.0140	0.5400	0.0866	+71	+25
11 H.	Libræ	5.4	2.69	6.1	19 23.8	4 12.6	+ 1 10.1	+0.4297	0.5401	0.0859	+50	−13
41	Libræ	5.3	+2.72	− 5.6	−19 2.2	7 15.4	+ 4 7.1	−0.2233	0.5406	−0.0810	+10	−51
κ	Libræ	5.0	2.74	5.6	19 25.1	8 43.4	+ 5 32.3	+0.0823	0.5409	0.0786	+28	−32
λ	Libræ	5.1	2.80	4.9	19 55.6	14 12.2	+10 50.6	+0.2405	0.5418	0.0696	+36	−24
47	Libræ	5.8	2.80	4.5	19 8.8	15 1.1	+11 38.0	−0.6822	0.5419	0.0682	−15	−90
10 G.	Scorpii	5.9	2.84	4.8	20 45.0	16 16.7	−11 8.8	+1.0123	0.5421	0.0661	+70	+25
β	Scorpii	2.9	+2.86	− 3.9	−19 35.1	20 1.1	− 7 31.6	−0.5145	0.5427	−0.0598	− 7	−73
56 B.	Scorpii	5.0	2.86	3.9	19 34.9	20 1.3	− 7 31.4	−0.5189	0.5427	0.0598	− 7	−73
ω^1	Scorpii	4.3	2.88	4.1	20 27.1	20 39.7	− 6 54.2	+0.4079	0.5428	0.0587	+45	−14
ω^2	Scorpii	4.6	2.90	4.2	20 39.1	20 56.6	− 6 37.9	+0.6133	0.5428	0.0582	+61	− 2
ν	Scorpii	3.9	2.88	3.4	19 15.1	23 9.8	− 4 28.9	−1.0638	0.5431	0.0544	−42	−90
84 B.	Scorpii	6.3	+2.93	− 3.7	−20 54.2	**29** 0 19.7	− 3 21.2	+0.7048	0.5433	−0.0524	+68	+ 3
51 G.	Scorpii	6.5	2.95	3.6	21 6.3	1 31.1	− 2 12.2	+0.8661	0.5435	0.0504	+69	+14
58 G.	Scorpii	6.2	2.94	3.1	20 1.3	2 33.6	− 1 11.6	−0.3852	0.5436	0.0486	− 1	−62
ψ	Ophiuchi	4.6	2.96	2.7	19 51.0	4 56.2	+ 1 6.4	−0.6869	0.5439	0.0444	−18	−90
ω	Ophiuchi	4.5	3.04	2.5	21 17.7	8 44.3	+ 4 47.1	+0.7585	0.5444	0.0378	+69	+ 7
123 B.	Scorpii	6.5	+3.06	− 1.4	−20 15.1	12 46.0	+ 8 41.1	−0.5348	0.5449	−0.0306	−11	−75

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
131 B. Scorpii	5.5	+3.06	− 1.2	−19 46.2	**29** 13 24.0	+ 9 17.8	−1.0873	0.5450	−0.0295	−47	−90
68 B. Ophiuchi	5.9	3.12	− 0.5	20 16.9	18 51.6	− 9 25.2	−0.6557	0.5456	0.0198	−19	−89
109 B. Ophiuchi	6.2	3.18	+ 0.4	20 22.9	**30** 0 13.2	− 4 14.1	−0.6246	0.5461	0.0102	−18	−85
116 B. Ophiuchi	6.3	3.22	0.1	21 27.2	0 53.0	− 3 35.6	+0.5546	0.5461	−0.0090	+51	− 6
ξ Ophiuchi	4.4	3.30	1.4	21 1.6	7 52.1	+ 3 9.9	+0.0637	0.5467	+0.0037	+19	−34
190 B. Ophiuchi	5.9	+3.31	+ 1.7	−21 22.0	9 37.1	+ 4 51.4	+0.4487	0.5467	+0.0068	+43	−12
52 Ophiuchi	6.4	3.38	2.4	21 59.4	14 36.1	+ 9 40.7	+1.1916	0.5471	0.0159	+69	+44
58 Ophiuchi	4.8	+3.41	+ 3.2	−21 38.6	18 26.1	−10 36.8	+0.8840	0.5472	+0.0228	+69	+15

OCTOBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
16 G. Sagittarii	6.4	+3.46	+ 5.1	−20 20.0	**1** 2 14.6	− 3 3.5	−0.3265	0.5476	+0.0369	+ 1	−58
30 G. Sagittarii	6.2	3.53	5.3	21 27.1	5 36.1	+ 0 11.3	+1.0369	0.5476	0.0430	+69	+27
39 G. Sagittarii	6.3	3.51	6.2	19 51.4	7 32.0	+ 2 3.4	−0.6281	0.5477	0.0464	−14	−85
μ Sagittarii	4.0	3.55	6.0	21 4.8	8 41.7	+ 3 10.8	+0.7689	0.5477	0.0485	+69	+ 7
15 Sagittarii	5.3	+3.55	+ 6.3	−20 45.1	9 23.0	+ 3 50.8	+0.4427	0.5477	+0.0497	+47	−12
16 Sagittarii	5.9	3.54	6.4	20 24.7	9 23.4	+ 3 51.1	+0.0697	0.5477	0.0498	+25	−33
21 Sagittarii	5.0	3.60	7.2	20 35.0	14 8.7	+ 8 27.1	+0.5154	0.5477	0.0582	+53	− 8
29 Sagittarii	5.3	3.70	9.4	20 24.9	**2** 1 34.3	− 4 29.7	+1.1073	0.5477	0.0782	+70	+33
171 B. Sagittarii	6.1	3.74	10.8	19 21.7	7 53.0	+ 1 36.5	+0.4846	0.5476	0.0890	+54	−10
173 B. Sagittarii	6.4	+3.74	+10.9	−19 13.1	7 54.6	+ 1 38.1	+0.3313	0.5476	+0.0890	+43	−19
187 B. Sagittarii	6.4	3.75	11.4	18 51.7	9 48.5	+ 3 28.2	+0.1152	0.5476	0.0922	+32	−31
190 B. Sagittarii	5.4	3.76	11.3	19 24.9	10 20.0	+ 3 58.7	+0.7659	0.5476	0.0931	+71	+ 7
d Sagittarii	5.0	3.80	12.2	19 5.7	14 44.4	+ 8 14.4	+0.8430	0.5475	0.1004	+71	+12
ρ Sagittarii	4.0	3.78	12.9	17 59.8	16 39.4	+10 5.7	−0.1512	0.5475	0.1036	+18	−46
45 Sagittarii	6.0	+3.80	+12.7	−18 27.3	16 43.6	+10 9.7	+0.3528	0.5475	+0.1037	+46	−17
267 B. Sagittarii	5.8	3.86	14.1	18 24.5	23 53.4	− 6 54.5	+1.0827	0.5474	0.1152	+72	+30
54 Sagittarii	5.4	3.83	15.0	16 28.6	**3** 1 38.6	− 5 12.6	−0.7974	0.5473	0.1180	−17	−90
e Sagittarii	5.2	3.84	15.2	16 18.6	2 29.4	− 4 22.6	−0.8744	0.5473	0.1193	−22	−90
g Sagittarii	5.1	3.88	16.6	15 42.2	9 46.3	+ 2 39.1	−0.6162	0.5472	0.1304	− 5	−82
16 B. Capricorni	6.2	+3.96	+18.5	−15 2.2	20 32.5	−10 55.8	+0.1615	0.5472	+0.1460	+40	−28
β Capricorni	3.2	3.96	18.6	15 2.0	20 39.2	−10 49.3	+0.1745	0.5472	0.1462	+41	−27
27 G. Capricorni	6.2	3.99	19.1	15 19.4	**4** 1 23.8	− 6 14.1	+1.1905	0.5473	0.1527	+75	+39
45 B. Capricorni	6.1	3.98	19.9	13 59.7	2 53.0	− 4 47.8	+0.0063	0.5473	0.1546	+32	−37
84 B. Capricorni	6.0	4.03	21.2	12 50.4	10 40.6	+ 2 44.6	+0.0257	0.5476	0.1647	+34	−36
16 B. Aquarii	6.4	+4.01	+21.8	−11 52.5	11 49.2	+ 3 50.9	−0.8053	0.5477	+0.1661	−12	−90
ν Aquarii	4.5	4.07	22.8	11 41.6	19 35.6	+11 22.0	+0.3327	0.5481	0.1752	+53	−19
51 G. Aquarii	6.5	4.06	23.2	10 56.1	21 48.6	−10 29.3	−0.0746	0.5483	0.1777	+30	−41
17 Aquarii	6.3	4.07	24.0	9 39.5	**5** 1 53.8	− 6 32.2	−0.6766	0.5487	0.1820	− 3	−87
19 Aquarii	5.6	4.09	24.0	10 5.2	2 57.7	− 5 30.3	−0.0328	0.5488	0.1831	+33	−39
ξ Aquarii	4.8	+4.11	+25.2	− 8 12.7	8 51.6	+ 0 12.0	−0.8937	0.5494	+0.1889	−15	−90
c^1 Capricorni	5.3	4.14	25.2	9 26.9	12 15.1	+ 3 28.7	+1.0404	0.5499	0.1920	+81	+23
30 Aquarii	5.6	4.17	26.6	6 54.4	20 48.4	+11 45.1	+0.0754	0.5513	0.1991	+40	−33
138 B. Aquarii	6.4	4.18	27.3	5 6.8	**6** 1 13.6	− 7 58.4	−0.8895	0.5521	0.2023	−13	−90
44 Aquarii	5.7	4.20	27.3	5 47.1	3 15.3	− 6 0.8	+0.2147	0.5526	0.2036	+49	−26
51 Aquarii	5.8	+4.21	+27.6	− 5 14.4	6 30.3	− 2 52.2	+0.3187	0.5533	+0.2056	+56	−20
187 B. Aquarii	6.3	4.21	28.2	3 19.1	9 50.6	+ 0 21.4	−0.9640	0.5541	0.2075	−18	−90
κ Aquarii	5.2	4.24	28.0	4 38.3	12 48.9	+ 3 13.8	+1.0076	0.5548	0.2090	+86	+21
207 B. Aquarii	6.3	4.24	28.3	3 58.1	14 13.0	+ 4 35.0	+0.6141	0.5552	0.2096	+79	− 4
6 G. Piscium	6.2	4.28	28.7	2 49.3	22 13.5	−11 40.6	+1.1318	0.5575	0.2127	+88	+30
3 Piscium	6.3	+4.29	+29.2	− 0 14.5	23 18.9	−10 37.4	−1.2624	0.5578	+0.2129	−44	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
22 B. Piscium	6.4	+4.34	+29.2	− 0 8.7	7 9 41.5	− 0 36.0	+0.8622	0.5614	+0.2147	+90	+11
κ Piscium	4.9	4.35	29.3	+ 0 49.2	11 13.4	+ 0 52.6	+0.2146	0.5620	0.2148	+50	−25
9 Piscium	6.4	4.35	29.3	0 41.1	11 21.9	+ 1 0.9	+0.3810	0.5620	0.2147	+60	−17
16 Piscium	5.7	4.37	29.4	1 39.6	15 28.2	+ 4 58.7	+0.2775	0.5636	0.2147	+53	−22
λ Piscium	4.6	4.38	29.2	1 20.5	17 59.7	+ 7 25.0	+1.1392	0.5646	0.2144	+90	+30
19 Piscium	5.4	+4.40	+29.4	+ 3 2.7	19 55.5	+ 9 16.8	−0.1619	0.5654	+0.2141	+28	−46
22 Piscium	5.8	4.41	29.2	2 29.3	22 23.6	+11 39.7	+0.9259	0.5664	0.2137	+90	+15
51 Piscium	5.6	4.51	28.3	6 31.0	8 16 2.1	+ 4 40.7	+0.6019	0.5745	0.2060	+78	− 3
136 B. Piscium	6.5	4.55	28.0	8 55.3	19 48.6	+ 8 19.1	−1.0211	0.5764	0.2034	−22	−82
π Piscium	5.6	4.66	24.8	11 44.1	9 19 11.7	+ 6 50.2	+0.6901	0.5882	0.1793	+90	+ 4
12 H^1. Arietis	6.3	+4.70	+22.8	+13 5.6	10 5 32.8	− 7 12.4	+1.1259	0.5932	+0.1643	+90	+36
19 Arietis	5.8	4.76	21.7	14 54.4	9 44.1	− 3 10.8	+0.0077	0.5951	0.1575	+38	−30
36 Arietis	6.5	4.81	18.5	17 25.6	22 7.0	+ 8 42.9	−0.6660	0.6003	0.1352	0	−71
40 Arietis	6.0	4.82	18.0	17 57.1	23 46.1	+10 18.1	−0.9647	0.6009	0.1319	−20	−73
π Arietis	5.2	4.79	18.1	17 8.0	11 0 4.4	+10 35.7	−0.1153	0.6010	0.1313	+31	−34
124 B. Arietis	6.4	+4.76	+17.9	+16 9.5	1 36.5	−11 55.9	+1.0468	0.6016	+0.1283	+90	+34
45 Arietis	6.0	4.81	17.3	18 0.5	2 37.1	−10 57.7	−0.6531	0.6019	0.1263	0	−69
ρ Arietis	5.6	4.82	17.2	17 42.3	2 51.4	−10 43.9	−0.3233	0.6020	0.1258	+19	−46
53 Arietis	6.0	4.79	16.2	17 34.4	7 9.3	− 6 36.3	+0.3299	0.6033	0.1169	+58	− 9
54 Arietis	6.5	4.82	16.0	18 29.4	7 30.1	− 6 16.4	−0.5358	0.6034	0.1162	+ 7	−59
175 B. Arietis	6.4	+4.79	+14.0	+18 28.7	14 45.0	+ 0 41.0	+0.2616	0.6053	+0.1005	+53	−11
13 Tauri	5.6	4.79	12.2	19 26.7	20 37.5	+ 6 19.3	−0.1446	0.6064	0.0872	+29	−31
14 Tauri	6.2	4.79	12.0	19 24.8	21 11.3	+ 6 51.7	−0.0645	0.6065	0.0859	+33	−27
43 Tauri	5.5	4.73	9.3	19 23.9	12 6 55.8	− 7 47.6	+0.6770	0.6075	0.0630	+90	+16
ω Tauri	4.8	4.73	8.1	20 23.0	10 1.5	− 4 49.5	−0.1169	0.6075	0.0555	+30	−28
51 Tauri	5.6	+4.77	+ 7.8	+21 23.1	10 26.3	− 4 25.7	−1.0899	0.6075	+0.0545	−32	−69
53 Tauri	5.3	4.75	7.7	20 57.0	10 50.9	− 4 2.0	−0.6356	0.6075	0.0535	+ 1	−62
56 Tauri	5.2	4.77	7.6	21 34.9	10 54.5	− 3 58.6	−1.2600	0.6075	0.0534	−57	−69
224 B. Tauri	6.1	4.72	7.5	20 38.0	11 58.9	− 2 56.8	−0.2620	0.6075	0.0508	+22	−35
227 B. Tauri	5.9	4.73	7.4	20 47.8	12 25.4	− 2 31.4	−0.4021	0.6075	0.0497	+14	−44
247 B. Tauri	5.8	+4.74	+ 6.6	+21 26.5	14 7.6	− 0 53.4	−0.9634	0.6074	+0.0456	−21	−69
282 B. Tauri	6.4	4.65	6.3	19 43.1	17 6.1	+ 1 57.9	+0.8778	0.6072	0.0383	+90	+30
129 H^1. Tauri	5.8	4.67	5.8	20 31.5	18 4.3	+ 2 53.7	+0.1101	0.6071	0.0359	+44	−13
ι Tauri	4.7	4.61	2.7	21 28.6	13 3 35.8	−11 57.9	−0.6091	0.6057	0.0126	+ 2	−57
330 B. Tauri	6.3	4.59	2.7	21 10.0	4 5.4	−11 29.5	−0.2934	0.6055	0.0114	+20	−34
333 B. Tauri	6.3	+4.53	+ 3.0	+19 41.8	4 33.8	−11 2.3	+1.1806	0.6054	+0.0102	+90	+57
l Tauri	5.2	4.54	2.5	20 18.8	5 26.0	−10 12.2	+0.5727	0.6052	0.0081	+78	+15
105 Tauri	6.0	4.58	2.2	21 36.0	5 27.6	−10 10.7	−0.7137	0.6052	0.0080	− 4	−68
107 Tauri	6.5	4.52	2.6	19 45.4	5 50.2	− 9 48.9	+1.1327	0.6051	+0.0071	+90	+52
n Tauri	5.1	4.55	0.7	22 0.8	9 50.4	− 5 58.5	−1.1188	0.6040	−0.0027	−35	−68
351 B. Tauri	6.2	+4.48	+ 1.4	+20 3.1	9 51.4	− 5 57.5	+0.8481	0.6040	−0.0027	+90	+31
353 B. Tauri	6.5	4.47	+ 1.3	19 44.0	10 31.1	− 5 19.4	+1.1641	0.6038	0.0043	+90	+56
ο Tauri	4.8	4.50	− 0.1	21 52.1	13 5.1	− 2 51.5	−0.9960	0.6030	0.0105	−24	−69
372 B. Tauri	6.1	4.43	0.3	20 25.1	15 26.6	− 0 35.8	+0 4290	0.6023	0.0162	+65	+ 6
ζ Tauri	3.0	4.43	1.0	21 5.6	16 59.5	+ 0 53.4	−0.2782	0.6017	0.0199	+21	−34
B. D. +19°1110	6.0	+4.32	− 2.2	+19 50.8	22 47.1	+ 6 27.1	+0.8222	0.5993	−0.0335	+90	+28
χ^1 Orionis	4.5	4.31	2.5	20 15.7	23 34.2	+ 7 12.4	+0.3778	0.5990	0.0354	+62	+ 1
57 Orionis	5.8	4.30	2.3	19 44.1	23 47.5	+ 7 25.2	+0.9016	0.5989	0.0359	+90	+32
64 Orionis	5.1	4.25	3.2	19 41.5	14 3 9.1	+10 38.8	+0.8119	0.5974	0.0436	+90	+26
χ^2 Orionis	4.7	4.26	3.4	20 8.4	3 19.8	+10 49.0	+0.3513	0.5973	0.0440	+59	0
68 Orionis	5.7	+4.21	− 4.2	+19 48.5	6 33.0	−10 5.3	+0.5339	0.5957	−0.0518	+74	+ 9

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
71 Orionis	5.1	+4.17	− 4.4	+19 11.0	14 7 41.3	− 8 59.7	+1.1065	0.5952	−0.0538	+90	+4
15 Geminorum	6.5	4.15	6.1	20 50.3	12 50.4	− 4 2.6	−0.8762	0.5924	0.0652	−15	−70
16 Geminorum	6.2	4.14	6.0	20 32.7	12 54.7	− 3 58.5	−0.5825	0.5924	0.0653	+ 4	−5
ν Geminorum	4.1	4.12	6.0	20 15.8	13 19.5	− 3 34.6	−0.3244	0.5921	0.0662	+19	−40
74 B. Geminorum	6.2	3.96	7.1	18 16.8	20 49.6	+ 3 38.2	+1.1356	0.5878	0.0820	+90	−46
110 B. Geminorum	6.2	+3.86	− 8.3	+17 52.2	15 3 0.8	+ 9 35.4	+1.0123	0.5840	−0.0943	+90	+3
162 B. Geminorum	5.7	3.66	10.6	17 15.4	15 20.9	− 2 31.9	+0.3380	0.5761	0.1170	+58	− 9
f Geminorum	5.3	3.62	11.4	17 51.4	18 37.0	+ 0 37.1	−0.6710	0.5740	0.1225	− 1	−71
1 Cancri	6.0	3.47	12.1	16 0.3	16 2 13.0	+ 7 56.7	+0.2608	0.5690	0.1347	+53	−15
2 B. Cancri	6.0	3.48	12.5	16 44.1	2 52.6	+ 8 34.9	−0.5832	0.5686	0.1357	+ 5	−66
5 Cancri	5.9	+3.46	−12.6	+16 40.6	4 10.9	+ 9 50.5	−0.7016	0.5677	−0.1376	− 2	−74
30 B. Cancri	6.1	3.36	12.7	14 52.0	8 22.7	−10 6.6	+0.5815	0.5650	0.1438	+78	+ 2
29 Cancri	5.9	3.24	13.7	14 28.6	16 15.7	− 2 30.0	−0.1878	0.5600	0.1543	+27	−42
84 B. Cancri	6.4	3.19	13.7	13 31.9	18 35.5	− 0 14.9	+0.4333	0.5585	0.1572	+65	− 8
A^1 Cancri	5.5	3.13	14.0	12 58.1	22 54.1	+ 3 54.9	+0.3321	0.5558	0.1623	+57	−14
A^2 Cancri	5.7	+3.09	−14.0	+12 24.2	17 0 37.1	+ 5 34.5	+0.6413	0.5548	−0.1643	+84	+ 2
60 Cancri	5.7	3.03	14.3	11 55.9	4 46.2	+ 9 35.2	+0.4446	0.5525	0.1687	+65	− 9
α Cancri	4.3	3.02	14.6	12 10.1	5 57.2	+10 43.9	−0.0026	0.5517	0.1700	+37	−34
κ Cancri	5.1	2.95	14.6	10 59.5	10 17.4	− 9 4.5	+0.4860	0.5493	0.1742	+68	− 7
209 B. Cancri	6.5	2.95	15.0	11 53.4	11 14.0	− 8 9.8	−0.6237	0.5488	0.1751	+ 3	−74
222 B. Cancri	6.3	+2.91	−15.3	+11 50.2	15 2.7	− 4 28.5	−1.2427	0.5467	−0.1785	−43	−79
ω Leonis	5.5	2.82	15.0	9 24.4	20 6.3	+ 0 25.2	+0.4027	0.5441	0.1826	+62	−13
3 Leonis	5.8	2.81	14.7	8 32.3	20 7.8	+ 0 26.7	+1.3129	0.5441	0.1826	+83	+56
h Leonis	5.2	2.81	15.3	10 4.2	21 46.7	+ 2 2.4	−0.6038	0.5433	0.1839	+ 4	−74
10 B. Sextantis	6.0	2.70	14.9	7 4.7	18 4 39.5	+ 8 42.1	+1.2762	0.5401	0.1886	+90	+48
14 Sextantis	6.3	+2.59	−15.2	+ 6 0.2	14 45.5	− 5 31.0	+0.4874	0.5359	−0.1941	+68	−10
19 Sextantis	5.9	2.56	15.0	5 0.7	17 44.3	− 2 37.7	+0.9627	0.5348	0.1954	+90	+18
155 B. Leonis	6.5	2.50	15.6	6 6.1	22 55.6	+ 2 24.0	−1.2182	0.5330	0.1974	−39	−84
237 B. Leonis	6.3	2.38	14.8	1 27.0	19 13 31.3	− 7 27.0	+0.8482	0.5290	0.2007	+90	+10
55 Leonis	6.1	2.38	14.7	1 9.9	15 17.0	− 5 44.5	+0.8019	0.5287	0.2008	+90	+ 7
p^3 Leonis	6.1	+2.34	−14.6	+ 0 25.9	19 18.7	− 1 50.0	+0.7815	0.5279	−0.2011	+90	+ 6
p^5 Leonis	5.3	2.30	14.6	+ 0 22.0	20 0 29.3	+ 3 11.3	−0.1900	0.5270	0.2010	+27	−48
388 B. Leonis	6.3	2.26	14.3	− 1 15.5	7 44.0	+10 13.1	+0.1089	0.5260	0.2004	+43	−31
e Leonis	5.1	2.26	14.0	2 33.6	8 58.6	+11 25.5	+1.2675	0.5260	0.2002	+88	+44
431 B. Leonis	6.2	2.23	14.1	1 59.5	13 7.9	− 8 32.6	−0.1766	0.5256	0.1993	+27	−47
78 B. Virginis	6.5	+2.17	−13.1	− 5 16.3	21 7 36.5	+ 9 23.1	−0.2475	0.5252	−0.1929	+23	−52
				NEW	*MOON.*						
150 B. Libræ	6.1	+2.49	− 5.0	−19 53.4	25 10 38.2	+ 9 24.1	+1.1212	0.5418	−0.0858	+71	+34
11 H. Libræ	5.4	2.48	4.9	19 23.8	11 4.3	+ 9 49.4	+0.5363	0.5418	0.0851	+58	− 6
41 Libræ	5.3	+2.50	− 4.5	−19 2.2	14 7.0	−11 13.7	−0.1147	0.5424	−0.0802	+17	−44
κ Libræ	5.0	2.51	4.4	19 25.1	15 34.9	− 9 48.5	+0.1930	0.5426	0.0778	+34	−26
λ Libræ	5.1	2.56	3.7	19 55.6	21 3.5	− 4 30.4	+0.3571	0.5434	0.0688	+43	−17
47 Libræ	5.8	2.55	3.4	19 8.7	21 52.5	− 3 43.0	−0.5669	0.5436	0.0674	− 8	−77
10 G. Scorpii	5.9	2.59	3.6	20 45.0	23 8.0	− 2 29.9	+1.1325	0.5438	0.0653	+70	+36
β Scorpii	2.9	+2.59	− 2.8	−19 35.1	26 2 52.4	+ 1 7.3	−0.3941	0.5442	−0.0590	0	−63
56 B. Scorpii	5.0	2.59	2.8	19 34.9	2 52.6	+ 1 7.5	−0.3986	0.5442	0.0590	0	−63
ω^1 Scorpii	4.3	2.61	2.9	20 27.1	3 31.0	+ 1 44.7	+0.5310	0.5444	0.0579	+55	− 7
ω^2 Scorpii	4.6	2.62	2.9	20 39.1	3 47.9	+ 2 1.0	+0.7372	0.5444	0.0574	+70	+ 5
ν Scorpii	3.9	2.60	2.3	19 15.1	6 1.1	+ 4 10.0	−0.9420	0.5446	0.0536	−33	−90
4 B. Scorpii	6.3	+2.64	− 2.5	−20 54.2	7 11.1	+ 5 17.7	+0.8321	0.5448	−0.0516	+70	+12

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
51 G. Scorpii	6.5	+2.65	− 2.3	−21 6.2	**26** 8 22.5	+ 6 26.9	+0.9948	0.5449	−0.0496	+70	+24
58 G. Scorpii	6.2	2.64	2.0	20 1.3	9 25.0	+ 7 27.3	−0.2589	0.5450	0.0478	+ 6	−53
ψ Ophiuchi	4.6	2.65	1.6	19 51.0	11 47.8	+ 9 45.5	−0.5594	0.5452	0.0437	−10	−77
ω Ophiuchi	4.5	2.71	1.3	21 17.7	15 36.2	−10 33.4	+0.8932	0.5456	0.0370	+69	+16
123 B. Scorpii	6.5	2.72	0.4	20 15.1	19 38.3	− 6 39.1	−0.4009	0.5459	0.0299	− 3	−63
131 B. Scorpii	5.5	+2.71	− 0.2	−19 46.2	20 16.4	− 6 2.3	−0.9545	0.5460	−0.0288	−36	−90
68 B. Ophiuchi	5.9	2.76	+ 0.4	20 16.9	**27** 1 44.8	− 0 44.4	−0.5179	0.5463	0.0191	−11	−73
109 B. Ophiuchi	6.2	2.81	1.2	20 22.9	7 7.5	+ 4 27.9	−0.4832	0.5465	0.0095	−10	−70
116 B. Ophiuchi	6.3	2.84	1.0	21 27.2	7 47.5	+ 5 6.6	+0.7010	0.5465	−0.0083	+66	+ 3
ξ Ophiuchi	4.4	2.90	2.1	21 1.6	14 48.6	+11 54.0	+0.2125	0.5466	+0.0043	+28	−25
190 B. Ophiuchi	5.9	+2.91	+ 2.5	−21 22.0	16 34.0	−10 24.0	+0.6002	0.5466	+0.0074	+56	− 3
58 Ophiuchi	4.8	2.98	3.8	21 38.6	**28** 1 26.6	− 1 48.7	+1.0427	0.5465	0.0232	+69	+28
16 G. Sagittarii	6.4	3.02	5.5	20 20.0	9 19.2	+ 5 48.6	−0.1710	0.5461	0.0372	+10	−48
30 G. Sagittarii	6.2	3.08	5.7	21 27.1	12 42.7	+ 9 5.5	+1.2021	0.5459	0.0432	+69	+45
39 G. Sagittarii	6.3	3.05	6.5	19 51.4	14 39.8	+10 58.8	−0.4726	0.5458	0.0466	− 5	−69
μ Sagittarii	4.0	+3.10	+ 6.3	−21 4.8	15 50.3	−11 53.0	+0.9338	0.5457	+0.0487	+69	+19
15 Sagittarii	5.3	3.09	6.6	20 45.1	16 32.0	−11 12.6	+0.6056	0.5456	0.0499	+60	− 3
16 Sagittarii	5.9	3.08	6.6	20 24.7	16 32.4	−11 12.2	+0.2303	0.5456	0.0499	+34	−24
21 Sagittarii	5.0	3.13	7.4	20 35.0	21 21.2	− 6 32.8	+0.6806	0.5452	0.0582	+67	+ 2
95 B. Sagittarii	5.7	3.11	8.2	18 46.7	23 41.4	− 4 17.1	−1.1695	0.5451	0.0622	−51	−90
29 Sagittarii	5.3	+3.22	+ 9.3	−20 24.9	**29** 8 56.5	+ 4 40.2	+1.2804	0.5442	+0.0778	+70	+62
171 B. Sagittarii	6.1	3.26	10.6	19 21.7	15 21.4	+10 52.6	+0.6537	0.5435	0.0884	+67	+ 1
173 B. Sagittarii	6.4	3.26	10.7	19 13.1	15 23.1	+10 54.3	+0.4991	0.5435	0.0884	+55	− 9
187 B. Sagittarii	6.4	3.26	11.1	18 51.7	17 19.0	−11 13.6	+0.2812	0.5433	0.0916	+41	−21
190 B. Sagittarii	5.4	3.28	11.0	19 24.9	17 51.1	−10 42.5	+0.9378	0.5432	0.0924	+71	+19
d Sagittarii	5.0	+3.31	+11.8	−19 5.7	22 20.3	− 6 21.9	+1.0161	0.5428	+0.0995	+71	+24
ρ Sagittarii	4.0	3.30	12.5	17 59.8	**30** 0 17.6	− 4 28.4	+0.0126	0.5426	0.1026	+27	−37
45 Sagittarii	6.0	3.32	12.3	18 27.4	0 21.9	− 4 24.2	+0.5214	0.5425	0.1027	+58	− 8
267 B. Sagittarii	5.8	3.38	13.5	18 24.5	7 40.5	+ 2 40.4	+1.2587	0.5418	0.1139	+72	+51
54 Sagittarii	5.4	3.36	14.4	16 28.6	9 27.9	+ 4 24.4	−0.6409	0.5416	0.1166	− 7	−85
e Sagittarii	5.2	+3.36	+14.6	−16 18.6	10 19.9	+ 5 14.7	−0.7190	0.5415	+0.1179	−12	−90
g Sagittarii	5.1	3.41	15.8	15 42.2	17 46.8	−11 32.7	−0.4595	0.5408	0.1287	+ 4	−67
16 B. Capricorni	6.2	3.49	17.6	15 2.2	**31** 4 49.0	− 0 51.5	+0.3240	0.5401	0.1438	+49	−19
β Capricorni	3.2	3.49	17.7	15 2.0	4 55.8	− 0 44.9	+0.3371	0.5401	0.1439	+50	−19
45 B. Capricorni	6.1	3.53	18.9	13 59.7	11 19.4	+ 5 26.6	+0.1646	0.5398	0.1521	+41	−28
84 B. Capricorni	6.0	+3.59	+20.2	−12 50.4	19 19.8	−10 48.3	+0.1806	0.5397	+0.1618	+43	−27
16 B. Aquarii	6.4	+3.58	+20.7	−11 52.5	20 30.4	− 9 40.0	−0.6613	0.5396	+0.1631	− 3	−86

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ν Aquarii	4.5	+3.65	+21.6	−11 41.7	**1** 4 30.0	− 1 55.6	+0.4865	0.5398	+0.1720	+63	−11
51 G. Aquarii	6.5	3.65	22.1	10 56.1	6 46.8	+ 0 16.8	+0.0727	0.5400	0.1743	+38	−33
17 Aquarii	6.3	3.67	23.0	9 39.5	10 59.1	+ 4 21.1	−0.5398	0.5402	0.1786	+ 5	−73
19 Aquarii	5.6	3.69	22.9	10 5.3	12 4.8	+ 5 24.9	+0.1114	0.5403	0.1796	+40	−31
ξ Aquarii	4.8	3.73	24.2	8 12.7	18 8.9	+11 17.3	−0.7647	0.5409	0.1853	− 7	−90
c^1 Capricorni	5.3	+3.77	+24.0	− 9 26.9	21 38.3	− 9 19.9	+1.1908	0.5413	+0.1883	+81	+37
30 Aquarii	5.6	3.82	25.5	6 54.4	**2** 6 26.3	− 0 48.9	+0.2063	0.5428	0.1952	+48	−26
138 B. Aquarii	6.4	3.84	26.4	5 6.8	10 58.9	+ 3 34.9	−0.7742	0.5437	0.1983	− 7	−90
44 Aquarii	5.7	3.87	26.3	5 47.1	13 3.9	+ 5 35.9	+0.3410	0.5442	0.1996	+56	−19
51 Aquarii	5.8	3.90	26.6	5 14.4	16 24.3	+ 8 49.8	+0.4427	0.5450	0.2016	+64	−13
187 B. Aquarii	6.3	+3.92	+27.4	− 3 19.1	19 49.9	−11 51.2	−0.8579	0.5460	+0.2035	−11	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
κ Aquarii	5.2	+3.95	+27.0	− 4 38.3	2 22 52.8	− 8 54.2	+1.1324	0.5468	+0.2050	+85	+30
207 B. Aquarii	6.3	3.97	27.4	3 58.1	3 0 19.1	− 7 30.7	+0.7329	0.5473	0.2056	+86	+ 3
6 G. Piscium	6.2	4.04	27.9	2 49.3	8 31.4	+ 0 25.4	+1.2460	0.5501	0.2087	+87	+42
3 Piscium	6.3	4.05	28.7	0 14.5	9 38.4	+ 1 30.3	−1.1729	0.5505	0.2090	−34	−90
22 B. Piscium	6.4	4.15	28.8	− 0 8.7	20 14.5	+11 45.2	+0.9585	0.5549	0.2110	+90	+17
κ Piscium	4.9	+4.17	+28.9	+ 0 49.2	21 48.2	−10 44.2	+0.3034	0.5556	+0.2111	+55	−21
9 Piscium	6.4	4.17	28.9	0 41.1	21 56.9	−10 35.9	+0.4710	0.5557	0.2111	+67	−12
16 Piscium	5.7	4.20	29.1	1 39.6	4 2 7.8	− 6 33.5	+0.3613	0.5577	0.2112	+59	−17
λ Piscium	4.6	4.22	28.8	1 20.5	4 42.0	− 4 4.5	+1.2257	0.5590	0.2111	+90	+40
19 Piscium	5.4	4.26	29.2	3 2.7	6 39.8	− 2 10.7	−0.0871	0.5600	0.2108	+32	−42
22 Piscium	5.8	+4.28	+29.0	+ 2 29.3	9 10.2	+ 0 14.5	+1.0043	0.5613	+0.2105	+90	+21
51 Piscium	5.6	4.48	28.6	6 31.0	5 3 1.2	− 6 31.9	+0.6524	0.5716	0.2037	+84	0
136 B. Piscium	6.5	4.54	28.6	8 55.3	6 49.3	− 2 52.0	−0.9797	0.5740	0.2013	−19	−81
π Piscium	5.6	4.81	25.7	11 44.1	6 6 13.1	− 4 20.2	+0.7004	0.5895	0.1784	+90	+ 6
12 H¹. Arietis	6.3	4.92	23.7	13 5.6	16 29.3	+ 5 32.3	+1.1192	0.5963	0.1639	+90	+37
19 Arietis	5.8	+5.00	+22.9	+14 54.4	20 37.9	+ 9 31.2	+0.0016	0.5989	+0.1573	+37	−30
36 Arietis	6.5	5.15	19.9	17 25.6	7 8 49.6	− 2 46.2	−0.6812	0.6061	0.1353	− 1	−71
40 Arietis	6.0	5.17	19.5	17 57.2	10 26.8	− 1 13.0	−0.9788	0.6069	0.1321	−21	−72
π Arietis	5.2	5.14	19.4	17 8.0	10 44.9	− 0 55.6	−0.1373	0.6071	0.1315	+29	−35
124 B. Arietis	6.4	5.12	18.9	16 9.5	12 15.2	+ 0 31.0	+1.0124	0.6079	0.1285	+90	+32
45 Arietis	6.0	+5.19	+18.7	+18 0.6	13 14.6	+ 1 28.1	−0.6728	0.6083	+0.1265	− 1	−70
ρ Arietis	5.6	5.20	18.5	17 42.4	13 28.5	+ 1 41.4	−0.3463	0.6085	0.1260	+18	−47
53 Arietis	6.0	5.19	17.4	17 34.4	17 41.1	+ 5 43.6	+0.2958	0.6105	0.1172	+55	−10
54 Arietis	6.5	5.22	17.3	18 29.4	18 1.5	+ 6 3.3	−0.5614	0.6106	0.1164	+ 5	−61
175 B. Arietis	6.4	5.25	15.2	18 28.7	8 1 6.3	−11 9.5	+0.2199	0.6135	0.1008	+50	−12
13 Tauri	5.6	+5.29	+13.4	+19 26.7	6 49.8	− 5 40.3	−0.1873	0.6154	+0.0875	+26	−34
14 Tauri	6.2	5.29	13.1	19 24.8	7 22.6	− 5 8.9	−0.1087	0.6156	0.0862	+31	−29
43 Tauri	5.5	5.29	10.0	19 23.9	16 50.6	+ 3 55.4	+0.6136	0.6176	0.0631	+83	+13
ω Tauri	4.8	5.31	8.9	20 23.0	19 50.8	+ 6 48.0	−0.1718	0.6179	0.0556	+27	−30
51 Tauri	5.6	5.36	8.7	21 23.1	20 14.8	+ 7 10.9	−1.1312	0.6180	0.0546	−36	−69
53 Tauri	5.3	+5.34	+ 8.6	+20 57.0	20 38.7	+ 7 33.9	−0.6836	0.6180	+0.0536	− 2	−66
224 B. Tauri	6.1	5.32	8.3	20 38.0	21 44.5	+ 8 36.9	−0.3164	0.6181	0.0508	+19	−38
227 B. Tauri	5.9	5.33	8.1	20 47.8	22 10.2	+ 9 1.4	−0.4549	0.6181	0.0497	+11	−47
247 B. Tauri	5.8	5.35	7.4	21 26.5	23 49.2	+10 36.3	−1.0092	0.6182	0.0455	−25	−69
282 B. Tauri	6.4	5.27	6.8	19 43.1	9 2 42.0	−10 38.2	+0.8020	0.6182	0.0382	+90	+26
129 H¹. Tauri	5.8	+5.30	+ 6.3	+20 31.5	3 38.3	− 9 44.3	+0.0452	0.6182	+0.0358	+40	−16
ι Tauri	4.7	5.30	2.9	21 28.6	12 50.9	− 0 54.9	−0.6697	0.6172	0.0121	− 1	−62
330 B. Tauri	6.3	5.28	2.8	21 10.0	13 19.5	− 0 27.5	−0.3593	0.6171	0.0109	+17	−37
333 B. Tauri	6.3	5.21	3.0	19 41.8	13 46.8	− 0 1.3	+1.0905	0.6170	0.0097	+90	+49
l Tauri	5.2	5.23	2.5	20 18.8	14 37.2	+ 0 46.9	+0.4919	0.6168	0.0075	+71	+11
105 Tauri	6.0	+5.29	+ 2.3	+21 36.0	14 38.8	+ 0 48.4	−0.7738	0.6168	+0.0075	− 8	−68
107 Tauri	6.5	5.21	2.5	19 45.4	15 0.6	+ 1 9.4	+1.0424	0.6167	+0.0065	+90	+45
n Tauri	5.1	5.28	0.7	22 0.8	18 52.6	+ 4 51.6	−1.1750	0.6158	−0.0034	−42	−68
351 B. Tauri	6.2	5.20	1.2	20 3.1	18 53.5	+ 4 52.5	+0.7595	0.6158	0.0034	+90	+27
353 B. Tauri	6.5	5.18	+ 1.0	19 44.0	19 31.8	+ 5 29.2	+1.0698	0.6156	0.0051	+90	+48
ο Tauri	4.8	+5.24	− 0.3	+21 52.1	22 0.4	+ 7 51.5	−1.0562	0.6149	−0.0113	−29	−68
372 B. Tauri	6.1	5.17	0.7	20 25.1	10 0 17.0	+10 2.5	+0.3436	0.6141	0.0171	+59	+ 2
ζ Tauri	3.0	5.18	1.4	21 5.6	1 46.6	+11 28.4	−0.3527	0.6135	0.0209	+17	−38
B. D. +19°1110	6.0	5.08	2.9	19 50.8	7 21.9	− 7 10.2	+0.7258	0.6112	0.0347	+90	+22
χ¹ Orionis	4.5	5.08	3.3	20 15.7	8 7.3	− 6 26.7	+0.2885	0.6108	0.0366	+55	− 3
57 Orionis	5.8	+5.07	− 3.2	+19 44.0	8 20.1	− 6 14.3	+0.8033	0.6107	−0.0371	+90	+26

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0. Δα	Red'ns from 1919.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
64 Orionis	5.1	+5.04	− 4.2	+19 41.5	10 11 34.6	− 3 7.8	+0.7132	0.6091	−0.0450	+90	+20
χ^2 Orionis	4.7	5.05	4.4	20 8.4	11 44.8	− 2 58.1	+0.2604	0.6090	0.0454	+53	− 5
68 Orionis	5.7	5,00	5.3	19 48.5	14 51.2	+ 0 0.7	+0.4382	0.6074	0.0528	+66	+ 4
71 Orionis	5.1	4.96	5.6	19 11.0	15 57.1	+ 1 3.9	+1.0005	0.6068	0.0553	+90	+38
15 Geminorum	6.5	4.97	7.5	20 50.3	20 55.4	+ 5 50.2	−0.9510	0.6039	0.0668	−20	−69
16 Geminorum	6.2	+4.96	− 7.4	+20 32.6	20 59.5	+ 5 54.1	−0.6623	0.6038	−0.0670	− 1	−65
ν Geminorum	4.1	4.94	7.4	20 15.8	21 23.4	+ 6 17.1	−0.4087	0.6036	0.0679	+14	−46
74 B. Geminorum	6.2	4.79	9.0	18 16.8	11 4 37.9	−10 45.7	+1.0239	0.5989	0.0838	+90	+37
110 B. Geminorum	6.2	4.70	10.4	17 52.1	10 36.7	− 5 1.1	+0.9008	0.5946	0.0963	+90	+27
162 B. Geminorum	5.7	4.52	13.3	17 15.4	22 33.0	+ 6 27.8	+0.2344	0.5856	0.1190	+51	−14
f Geminorum	5.3	+4.48	−14.2	+17 51.4	12 1 43.2	+ 9 30.9	−0.7601	0.5831	−0.1246	− 6	−72
1 Cancri	6.0	4.32	15.2	16 0.2	9 5.9	− 7 22.8	+0.1568	0.5774	0.1367	+46	−20
2 B. Cancri	6.0	4.34	15.6	16 44.0	9 44.3	− 6 45.8	−0.6752	0.5768	0.1377	− 1	−72
5 Cancri	5.9	4.32	15.8	16 40.5	11 0.4	− 5 32.5	−0.7922	0.5758	0.1396	− 8	−73
30 B. Cancri	6.1	4.21	16.0	14 51.9	15 5.5	− 1 36.2	+0.4726	0.5726	0.1456	+68	− 4
29 Cancri	5.9	+4.09	−17.2	+14 28.5	22 46.6	+ 5 48.4	−0.2867	0.5667	−0.1561	+21	−47
84 B. Cancri	6.4	4.04	17.4	13 31.8	13 1 3.1	+ 8 0.2	+0.3267	0.5649	0.1589	+57	−13
A^1 Cancri	5.5	3.97	17.8	12 58.0	5 15.8	−11 55.9	+0.2270	0.5618	0.1639	+51	−19
A^2 Cancri	5.7	3.93	17.8	12 24.2	6 56.7	−10 18.6	+0.5330	0.5606	0.1658	+72	− 4
60 Cancri	5.7	3.87	18.2	11 55.9	11 0.6	− 6 23.0	+0.3391	0.5576	0.1701	+58	−14
α Cancri	4.3	+3.86	−18.5	+12 10.0	12 10.2	− 5 15.7	−0.1031	0.5568	−0.1713	+31	−38
κ Cancri	5.1	3.78	18.6	10 59.4	16 25.5	− 1 9.0	+0.3811	0.5538	0.1754	+61	−13
209 B. Cancri	6.5	3.78	19.1	11 53.4	17 21.1	− 0 15.2	−0.7172	0.5532	0.1762	− 3	−78
222 B. Cancri	6.3	3.73	19.4	11 50.1	21 6.0	+ 3 22.2	−1.3301	0.5507	0.1795	−61	−75
ω Leonis	5.5	3.63	19.1	9 24.3	14 2 4.9	+ 8 11.1	+0.3011	0.5475	0.1834	+55	−18
3 Leonis	5.8	+3.61	−18.8	+ 8 32.2	2 6.4	+ 8 12.6	+1.2034	0.5475	−0.1834	+90	+41
h Leonis	5.2	3.61	19.5	10 4.1	3 43.8	+ 9 46.8	−0.6964	0.5465	0.1846	− 1	−80
10 B. Sextantis	6.0	3.49	19.1	7 4.7	10 31.3	− 7 38.9	+1.1709	0.5425	0.1890	+90	+36
25 B. Sextantis	6.3	3.44	19.1	6 20.1	14 9.7	− 4 7.4	+1.2624	0.5405	0.1911	+90	+46
14 Sextantis	6.3	3.36	19.4	6 0.1	20 31.3	+ 2 2.2	+0.3919	0.5372	0.1941	+61	−15
19 Sextantis	5.9	+3.32	−19.2	+ 5 0.6	23 28.8	+ 4 54.2	+0.8660	0.5358	−0.1953	+90	+12
155 B. Leonis	6.5	3.25	19.9	6 6.0	15 4 38.1	+ 9 53.9	−1.3015	0.5335	0.1970	−50	−84
237 B. Leonis	6.3	3.09	18.8	1 27.0	19 10.7	− 0 0.1	+0.7632	0.5282	0.1998	+90	+ 5
55 Leonis	6.1	3.08	18.7	1 9.8	20 56.2	+ 1 42.2	+0.7181	0.5277	0.1999	+90	+ 2
p^3 Leonis	6.1	3.03	18.5	0 25.8	16 0 57.8	+ 5 36.5	+0.7003	0.5266	0.2000	+89	+ 1
p^5 Leonis	5.3	+2.98	−18.6	+ 0 22.0	6 8.7	+10 38.0	−0.2662	0.5254	−0.1998	+23	−53
388 B. Leonis	6.3	2.92	18.0	− 1 15.5	13 24.3	− 6 19.3	+0.0363	0.5240	0.1990	+39	−35
e Leonis	5.1	2.91	17.6	2 33.7	14 39.0	− 5 6.8	+1.1947	0.5239	0.1987	+87	+36
431 B. Leonis	6.2	2.87	17.7	1 59.6	18 49.2	− 1 4.0	−0.2456	0.5233	0.1978	+24	−51
78 B. Virginis	6.5	2.75	16.2	5 16.4	17 13 23.5	− 7 2.5	−0.3053	0.5224	0.1912	+20	−55
χ Virginis	4.8	+2.68	−15.1	− 7 33.3	18 2 20.4	+ 5 31.6	−0.2464	0.5231	−0.1840	+22	−52
ψ Virginis	5.0	2.66	14.3	9 6.2	10 8.6	−10 54.0	+0.0356	0.5239	0.1786	+36	−35
49 Virginis	5.2	2.64	13.6	10 18.7	17 7.0	− 4 8.0	+0.1353	0.5249	0.1732	+42	−30
50 Virginis	6.2	2.63	13.6	9 54.1	18 4.6	− 3 12.1	−0.4814	0.5251	0.1724	+ 8	−68
α Virginis(*Spica*)	1.2	2.60	12.8	10 44.5	19 1 59.5	+ 4 28.7	−0.8950	0.5266	0.1655	−17	−90
i Virginis	5.7	+2.61	−12.4	−12 17.4	2 46.1	+ 5 14.0	+0.6819	0.5267	−0.1647	+77	+ 1
550 B. Virginis	6.0	2.61	12.0	12 48.2	6 49.3	+ 9 9.9	+0.5875	0.5276	0.1609	+70	− 5
86 Virginis	5.6	2.58	11.6	12 1.4	12 33.4	− 9 16.3	−1.1781	0.5289	0.1551	−41	−90
621 B. Virginis	6.4	2.59	10.3	14 35.1	21 53.7	− 0 12.9	+0.2513	0.5312	0.1448	+45	−23
40 H. Virginis	5.1	+2.60	− 9.8	−15 55.4	20 1 5.8	+ 2 53.3	+1.2738	0.5320	−0.1410	+74	+51
				NEW	*MOON.*						

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
58 Ophiuchi	4.8	+2.82	+ 4.3	−21 38.6	**24** 7 38.0	+ 6 10.3	+1.0589	0.5483	+0.0234	+68	+30
16 G. Sagittarii	6.4	2.83	5.8	20 20.0	15 30.1	−10 13.0	−0.1562	0.5477	0.0374	+10	−47
30 G. Sagittarii	6.2	2.87	6.2	21 27.1	18 53.5	− 6 56.2	+1.2205	0.5475	0.0434	+69	+48
39 G. Sagittarii	6.3	2.84	6.7	19 51.4	20 50.6	− 5 2.9	−0.4581	0.5472	0.0468	− 5	−68
μ Sagittarii	4.0	2.88	6.7	21 4.8	22 1.1	− 3 54.7	+0.9520	0.5472	0.0489	+69	+20
15 Sagittarii	5.3	+2.87	+ 6.9	−20 45.1	22 42.8	− 3 14.3	+0.6231	0.5470	+0.0501	+61	− 1
16 Sagittarii	5.9	2.87	6.9	20 24.7	22 43.2	− 3 13.9	+0.2467	0.5470	0.0501	+34	−23
Y Sagittarii (*var.*)	5.4	2.85	7.7	18 53.7	**25** 1 40.6	− 0 22.3	−1.2762	0.5467	0.0552	−68	−75
21 Sagittarii	5.0	2.89	7.6	20 35.0	3 32.1	+ 1 25.6	+0.6988	0.5465	0.0584	+68	+ 3
95 B. Sagittarii	5.7	2.87	8.3	18 46.7	5 52.4	+ 3 41.4	−1.1571	0.5462	0.0624	−50	−90
171 B. Sagittarii	6.1	+2.96	+10.5	−19 21.7	21 35.0	− 5 6.4	+0.6733	0.5437	+0.0884	+68	+ 1
173 B. Sagittarii	6.4	2.96	10.6	19 13.1	21 36.7	− 5 4.7	+0.5179	0.5437	0.0884	+56	− 8
187 B. Sagittarii	6.4	2.96	10.9	18 51.7	23 33.0	− 3 12.1	+0.2091	0.5434	0.0915	+42	−20
190 B. Sagittarii	5.4	2.98	10.9	19 24.9	**26** 0 5.3	− 2 40.8	+0.9588	0.5433	0.0924	+71	+20
d Sagittarii	5.0	3.00	11.6	19 5.7	4 36.0	+ 1 41.4	+1.0380	0.5425	0.0995	+71	+26
ρ Sagittarii	4.0	+2.98	+12.2	−17 59.8	6 34.0	+ 3 35.6	+0.0290	0.5421	+0.1025	+27	−36
45 Sagittarii	6.0	3.00	12.0	18 27.4	6 38.3	+ 3 39.7	+0.5406	0.5421	0.1026	+59	− 7
267 B. Sagittarii	5.8	3.04	13.1	18 24.5	14 0.2	+10 47.6	+1.2825	0.5407	0.1136	+72	+57
54 Sagittarii	5.4	3.02	13.8	16 28.6	15 48.6	−11 27.4	−0.6293	0.5404	0.1163	− 7	−83
e Sagittarii	5.2	3.02	14.0	16 18.7	16 41.0	−10 36.7	−0.7081	0.5403	0.1175	−12	−90
g Sagittarii	5.1	+3.05	+15.1	−15 42.2	**27** 0 12.5	− 3 19.5	−0.4480	0.5389	+0.1281	+ 4	−66
16 B. Capricorni	6.2	3.12	16.8	15 2.2	11 23.3	+ 7 30.3	+0.3407	0.5370	0.1428	+50	−18
β Capricorni	3.2	3.12	16.8	15 2.0	11 30.3	+ 7 37.1	+0.3539	0.5370	0.1430	+51	−17
45 B. Capricorni	6.1	3.16	17.9	13 59.7	18 0.0	−10 5.3	+0.1791	0.5361	0.1509	+41	−27
84 B. Capricorni	6.0	3.21	19.0	12 50.4	**28** 2 9.2	− 2 11.4	+0.1943	0.5350	0.1602	+43	−26
16 B. Aquarii	6.4	+3.20	+19.6	−11 52.5	3 21.1	− 1 1.7	−0.6569	0.5349	+0.1615	− 4	−85
ν Aquarii	4.5	3.26	20.3	11 41.7	11 30.9	+ 6 52.9	+0.5024	0.5342	0.1700	+64	−10
51 G. Aquarii	6.5	3.27	20.8	10 56.1	13 50.8	+ 9 8.4	+0.0834	0.5341	0.1723	+38	−32
17 Aquarii	6.3	3.29	21.6	9 39.6	18 9.1	−10 41.3	−0.5375	0.5340	0.1763	+ 5	−73
19 Aquarii	5.6	3.31	21.4	10 5.3	19 16.5	− 9 35.9	+0.1216	0.5339	0.1773	+41	−30
ξ Aquarii	4.8	+3.35	+22.7	− 8 12.7	**29** 1 30.0	− 3 34.0	−0.7673	0.5339	+0.1827	− 8	−90
c^1 Capricorni	5.3	3.38	22.5	9 26.9	5 5.1	− 0 5.5	+1.2144	0.5340	0.1855	+81	+39
30 Aquarii	5.6	3.45	24.0	6 54.5	14 8.5	+ 8 41.0	+0.2146	0.5346	0.1920	+48	−25
138 B. Aquarii	6.4	3.48	24.8	5 6.8	18 49.4	−10 46.8	−0.7814	0.5352	0.1950	− 7	−90
44 Aquarii	5.7	3.50	24.7	5 47.1	20 58.4	− 8 41.8	+0.3502	0.5355	0.1962	+57	−18
51 Aquarii	5.8	+3.54	+25.0	− 5 14.4	**30** 0 25.2	− 5 21.6	+0.4530	0.5360	+0.1981	+65	−13
187 B. Aquarii	6.3	3.56	25.8	3 19.1	3 57.6	− 1 55.8	−0.8686	0.5367	0.1998	−12	−90
κ Aquarii	5.2	3.60	25.4	4 38.3	7 6.6	+ 1 7.4	+1.1525	0.5374	0.2012	+85	+32
207 B. Aquarii	6.3	3.62	25.8	3 58.1	8 35.8	+ 2 33.7	+0.7464	0.5377	0.2019	+86	+ 4
6 G. Piscium	6.2	3.70	26.2	2 49.3	17 5.2	+10 47.0	+1.2666	0.5400	0.2047	+87	+44
3 Piscium	6.3	+3.72	+27.2	− 0 14.5	18 14.5	+11 54.2	−1.1919	0.5404	+0.2050	−36	−90

DECEMBER.

22 B. Piscium	6.4	+3.85	+27.2	− 0 8.7	**1** 5 13.4	− 1 27.9	+0.9727	0.5444	+0.2069	+90	+18
κ Piscium	4.9	+3.87	+27.4	+ 0 49.2	6 50.5	+ 0 6.0	+0.3066	0.5450	+0.2070	+55	−20
9 Piscium	6.4	3.87	27.4	0 41.1	6 59.5	+ 0 14.6	+0.4770	0.5451	0.2070	+67	−11
16 Piscium	5.7	3.92	27.7	1 39.6	11 19.5	+ 4 26.3	+0.3646	0.5470	0.2070	+59	−17
λ Piscium	4.6	3.94	27.3	1 20.5	13 59.2	+ 7 0.7	+1.2428	0.5483	0.2069	+90	+42
19 Piscium	5.4	3.98	27.9	3 2.7	16 1.2	+ 8 58.7	−0.0917	0.5492	0.2067	+32	−42
22 Piscium	5.8	+4.02	+27.6	+ 2 29.3	18 37.1	+11 29.5	+1.0170	0.5505	+0.2063	+90	+22

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's						At Conjunction in R. A.					Limiting Parallels.	
	Name.	Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
			Δα	Δδ								
			s	″	° ′	d h m	h m				°	°
51	Piscium	5.6	+4.28	+27.7	+ 6 31.0	2 13 5.5	+ 5 20.5	+0.6569	0.5613	+0.1999	+84	0
136 B.	Piscium	6.5	4.36	27.9	8 55.3	17 1.2	+ 9 8.0	−0.9993	0.5639	0.1976	−21	−82
π	Piscium	5.6	4.74	25.3	11 44.1	3 17 6.2	+ 8 21.2	+0.7024	0.5813	0.1759	+90	+ 6
12 H^1.	Arietis	6.3	4.91	23.5	13 5.6	4 3 36.7	− 5 32.0	+1.1243	0.5894	0.1621	+90	+37
19	Arietis	5.8	5.03	22.9	14 54.4	7 50.2	− 1 28.2	−0.0032	0.5926	0.1557	+37	−30
36	Arietis	6.5	+5.25	+20.2	+17 25.6	20 13.6	+10 26.1	−0.6881	0.6017	+0.1344	− 2	−72
40	Arietis	6.0	5.29	19.9	17 57.2	21 52.1	−11 59.4	−0.9868	0.6028	0.1313	−21	−73
π	Arietis	5.2	5.26	19.7	17 8.0	22 10.3	−11 42.0	−0.1409	0.6030	0.1308	+29	−35
124 B.	Arietis	6.4	5.25	19.0	16 9.5	23 41.6	−10 14.2	+1.0146	0.6040	0.1278	+90	+32
45	Arietis	6.0	5.32	19.1	18 0.6	5 0 41.7	− 9 16.6	−0.6783	0.6047	0.1258	− 1	−70
ρ	Arietis	5.6	+5.33	+18.8	+17 42.4	0 55.8	− 9 3.0	−0.3503	0.6048	+0.1254	+18	−47
53	Arietis	6.0	5.35	17.7	17 34.4	5 10.8	− 4 58.4	+0.2951	0.6076	0.1169	+55	−10
54	Arietis	6.5	5.39	17.7	18 29.4	5 31.3	− 4 38.7	−0.5649	0.6078	0.1161	+ 5	−61
175 B.	Arietis	6.4	5.46	15.5	18 28.7	12 38.7	+ 2 11.2	+0.2200	0.6120	0.1007	+50	−12
13	Tauri	5.6	5.55	13.6	19 26.7	18 23.0	+ 7 41.3	−0.1864	0.6150	0.0876	+26	−34
14	Tauri	6.2	+5.56	+13.4	+19 24.8	18 55.9	+ 8 12.7	−0.1076	0.6153	+0.0864	+31	−29
43	Tauri	5.5	5.63	10.1	19 23.9	6 4 22.7	− 6 44.2	+0.6156	0.6191	0.0635	+83	+13
ω	Tauri	4.8	5.68	9.1	20 23.0	7 21.9	− 3 52.6	−0.1672	0.6200	0.0560	+27	−29
51	Tauri	5.6	5.73	9.0	21 23.1	7 45.8	− 3 29.7	−1.1235	0.6201	0.0550	−35	−69
53	Tauri	5.3	5.71	8.8	20 57.0	8 9.5	− 3 7.1	−0.6772	0.6202	0.0540	− 2	−66
224 B.	Tauri	6.1	+5.70	+ 8.5	+20 38.0	9 14.9	− 2 4.4	−0.3107	0.6205	+0.0513	+19	−38
227 B.	Tauri	5.9	5.71	8.3	20 47.8	9 40.4	− 1 40.0	−0.4485	0.6206	0.0502	+12	−47
247 B.	Tauri	5.8	5.75	7.7	21 26.5	11 18.6	− 0 5.9	−1.0000	0.6210	0.0460	−24	−69
282 B.	Tauri	6.4	5.68	6.6	19 43.1	14 9.8	+ 2 37.9	+0.8046	0.6216	0.0387	+90	+26
129 H^1.	Tauri	5.8	5.72	6.3	20 31.5	15 5.5	+ 3 31.3	+0.0513	0.6217	0.0363	+40	−15
ι	Tauri	4.7	+5.79	+ 2.8	+21 28.6	7 0 11.0	−11 46.5	−0.6560	0.6224	+0.0125	− 1	−61
330 B.	Tauri	6.3	5.77	2.7	21 10.0	0 39.1	−11 19.6	−0.3475	0.6224	0.0113	+17	−37
333 B.	Tauri	6.3	5.70	2.5	19 41.8	1 6.0	−10 53.8	+1.0924	0.6224	0.0101	+90	+49
l	Tauri	5.2	5.73	2.2	20 18.8	1 55.7	−10 6.3	+0.4980	0.6223	0.0079	+71	+11
105	Tauri	6.0	5.79	2.2	21 36.0	1 57.2	−10 4.9	−0.7584	0.6223	0.0078	− 7	−69
107	Tauri	6.5	+5.71	+ 2.1	+19 45.4	2 18.7	− 9 44.3	+1.0447	0.6223	+0.0069	+90	+46
n	Tauri	5.1	5.81	0.5	22 0.8	6 6.7	− 6 6.0	−1.1543	0.6220	−0.0031	−39	−68
351 B.	Tauri	6.2	5.72	0.6	20 3.1	6 7.6	− 6 5.1	+0.7644	0.6220	0.0031	+90	+27
353 B.	Tauri	6.5	5.71	+ 0.4	19 44.0	6 45.2	− 5 29.2	+1.0724	0.6219	0.0048	+90	+48
ο	Tauri	4.8	5.80	− 0.6	21 52.1	9 11.0	− 3 9.7	−1.0347	0.6216	0.0111	−27	−69
372 B.	Tauri	6.1	+5.73	− 1.4	+20 25.0	11 24.8	− 1 1.5	+0.3534	0.6212	−0.0169	+60	+ 2
ζ	Tauri	3.0	5.76	2.0	21 5.6	12 52.5	+ 0 22.5	−0.3358	0.6209	0.0208	+18	−37
	B. D. +19°1110	6.0	5.69	3.9	19 50.8	18 20.2	+ 5 36.3	+0.7336	0.6193	0.0348	+90	+22
χ^1	Orionis	4.5	5.69	4.3	20 15.7	19 4.6	+ 6 18.8	+0.3012	0.6191	0.0367	+56	− 2
57	Orionis	5.8	5.68	4.3	19 44.0	19 17.1	+ 6 30.9	+0.8105	0.6190	0.0372	+90	+27
64	Orionis	5.1	+5.66	− 5.4	+19 41.5	22 26.8	+ 9 32.5	+0.7222	0.6178	−0.0452	+90	+21
χ^2	Orionis	4.7	5.68	5.5	20 8.4	22 36.8	+ 9 42.1	+0.2746	0.6177	0.0457	+54	− 4
68	Orionis	5.7	5.65	6.6	19 48.5	8 1 38.3	−11 23.9	+0.4513	0.6165	0.0532	+67	+ 5
71	Orionis	5.1	5.62	7.1	19 11.0	2 42.4	−10 22.6	+1.0071	0.6160	0.0558	+90	+39
15	Geminorum	6.5	5.66	8.8	20 50.3	7 32.4	− 5 44.6	−0.9181	0.6136	0.0675	−18	−70
16	Geminorum	6.2	+5.64	− 8.8	+20 32.6	7 36.4	− 5 40.8	−0.6331	0.6136	−0.0677	+ 1	−63
ν	Geminorum	4.1	5.63	8.9	20 15.7	7 59.6	− 5 18.5	−0.3826	0.6134	0.0686	+15	−44
74 B.	Geminorum	6.2	5.50	11.0	18 16.8	15 1.2	+ 1 25.6	+1.0333	0.6093	0.0849	+90	+38
110 B.	Geminorum	6.2	5.44	12.8	17 52.1	20 48.5	+ 6 58.9	+0.9137	0.6055	0.0976	+90	+28
162 B.	Geminorum	5.7	5.30	16.1	17 15.3	9 8 20.6	− 5 56.5	+0.2616	0.5971	0.1210	+53	−12
f	Geminorum	5.3	+5.28	−17.0	+17 51.3	11 24.1	− 3 0.2	−0.7156	0.5947	−0.1267	− 3	−72

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's						At Conjunction in R. A.					Limiting Parallels.	
Name.		Mag.	Red'ns from 1919.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
			Δα	Δδ								
			s	″	° ′	d h m	h m				°	°
1	Cancri	6.0	+5.14	−18.5	+16 0.1	**9** 18 31.0	+ 3 50.2	+0.1895	0.5890	−0.1390	+49	−18
2 B.	Cancri	6.0	5.16	18.8	16 44.0	19 8.1	+ 4 25.9	−0.6285	0.5885	0.1401	+ 1	−69
5	Cancri	5.9	5.14	19.1	16 40.5	20 21.4	+ 5 36.4	−0.7430	0.5875	0.1421	− 5	−74
30 B.	Cancri	6.1	5.04	19.6	14 51.9	**10** 0 17.6	+ 9 23.8	+0.5025	0.5842	0.1483	+70	− 2
29	Cancri	5.9	4.94	21.2	14 28.4	7 41.9	− 7 28.3	−0.2410	0.5781	0.1588	+24	−44
84 B.	Cancri	6.4	+4.89	−21.4	+13 31.7	9 53.4	− 5 21.6	+0.3630	0.5763	−0.1617	+59	−12
A^1	Cancri	5.5	4.82	22.0	12 58.0	13 57.0	− 1 26.8	+0.2667	0.5730	0.1668	+53	−17
A^2	Cancri	5.7	4.79	22.2	12 24.1	15 34.2	+ 0 6.9	+0.5682	0.5716	0.1687	+76	− 1
60	Cancri	5.7	4.73	22.7	11 55.8	19 29.4	+ 3 53.7	+0.3792	0.5685	0.1731	+60	−12
α	Cancri	4.3	4.72	22.9	12 9.9	20 36.6	+ 4 58.6	−0.0552	0.5676	0.1743	+34	−36
κ	Cancri	5.1	+4.65	−23.2	+10 59.3	**11** 0 42.8	+ 8 56.1	+0.4225	0.5644	−0.1784	+64	−10
209 B.	Cancri	6.5	4.65	23.7	11 53.3	1 36.5	+ 9 47.9	−0.6574	0.5637	0.1793	+ 1	−76
222 B.	Cancri	6.3	4.61	24.1	11 50.1	5 13.6	−10 42.4	−1.2590	0.5609	0.1825	−46	−79
ω	Leonis	5.5	4.51	24.0	9 24.2	10 2.3	− 6 3.7	+0.3475	0.5573	0.1864	+58	−15
3	Leonis	5.8	4.49	23.8	8 32.2	10 3.8	− 6 2.1	+1.2353	0.5573	0.1864	+90	+44
h	Leonis	5.2	+4.49	−24.4	+10 4.0	11 38.0	− 4 31.2	−0.6336	0.5562	−0.1876	+ 2	−76
10 B.	Sextantis	6.0	4.37	24.2	7 4.6	18 12.2	+ 1 49.8	+1.2068	0.5515	0.1919	+90	+40
25 B.	Sextantis	6.3	4.32	24.3	6 20.0	21 43.8	+ 5 14.5	+1.2984	0.5492	0.1939	+88	+52
14	Sextantis	6.3	4.24	24.7	6 0.0	**12** 3 53.9	+11 12.4	+0.4432	0.5453	0.1968	+65	−12
19	Sextantis	5.9	4.19	24.6	5 0.5	6 46.2	−10 0.9	+0.9114	0.5436	0.1979	+90	+15
155 B.	Leonis	6.5	+4.13	−25.3	+ 6 5.9	11 47.0	− 5 9.7	−1.2246	0.5408	−0.1995	−40	−84
237 B.	Leonis	6.3	3.96	24.3	1 26.9	**13** 1 58.0	+ 8 34.7	+0.8161	0.5339	0.2018	+90	+ 8
55	Leonis	6.1	3.95	24.2	1 9.7	3 41.2	+10 14.7	+0.7720	0.5332	0.2019	+90	+ 6
p^3	Leonis	6.1	3.90	24.0	0 25.7	7 37.6	− 9 56.1	+0.7553	0.5316	0.2018	+90	+ 4
p^5	Leonis	5.3	3.84	24.0	+ 0 21.9	12 42.4	− 5 0.7	−0.1999	0.5298	0.2014	+26	−49
388 B.	Leonis	6.3	+3.77	−23.4	− 1 15.6	19 50.2	+ 1 54.2	+0.1000	0.5276	−0.2003	+43	−32
e	Leonis	5.1	3.77	23.0	2 33.8	21 3.8	+ 3 5.6	+1.2474	0.5273	0.2000	+88	+42
431 B.	Leonis	6.2	3.72	23.0	1 59.7	**14** 1 10.2	+ 7 4.5	−0.1792	0.5263	0.1990	+27	−47
78 B.	Virginis	6.5	3.57	21.2	5 16.5	19 31.5	+ 0 52.9	−0.2397	0.5235	0.1917	+23	−51
χ	Virginis	4.8	3.48	19.8	7 33.3	**15** 8 23.0	−10 38.3	−0.1834	0.5231	0.1842	+25	−48
ψ	Virginis	5.0	+3.44	−18.7	− 9 6.3	16 9.4	− 3 5.7	+0.0954	0.5233	−0.1787	+40	−32
49	Virginis	5.2	3.40	17.7	10 18.8	23 6.8	+ 3 39.3	+0.1929	0.5240	0.1731	+45	−26
50	Virginis	6.2	3.39	17.8	9 54.2	**16** 0 4.3	+ 4 35.0	−0.4218	0.5241	0.1723	+11	−63
α	Virginis (*Spica*)	1.2	3.34	16.8	10 44.6	7 59.0	−11 44.4	−0.8371	0.5251	0.1654	−14	−90
i	Virginis	5.7	3.36	16.2	12 17.5	8 45.6	−10 59.2	+0.7351	0.5252	0.1646	+78	+ 4
550 B.	Virginis	6.0	+3.34	−15.6	−12 48.2	12 49.0	− 7 3.0	+0.6396	0.5259	−0.1607	+74	− 2
86	Virginis	5.6	3.29	15.2	12 1.5	18 33.5	− 1 28.9	−1.1244	0.5270	0.1549	−36	−90
621 B.	Virginis	6.4	3.28	13.4	14 35.2	**17** 3 55.2	+ 7 36.0	+0.2980	0.5290	0.1446	+48	−21
26	Libræ	6.3	3.15	7.9	17 28.1	**18** 14 45.0	− 6 38.4	−0.7797	0.5382	0.0985	−18	−90
28	Libræ	6.2	3.15	7.4	17 52.0	17 50.3	− 3 39.0	−0.6347	0.5391	0.0939	−10	−85
150 B.	Libræ	6.1	+3.17	− 6.2	−19 53.4	23 5.1	+ 1 26.0	+1.1417	0.5405	−0.0858	+71	+37
11 H.	Libræ	5.4	3.16	6.2	19 23.8	23 31.3	+ 1 51.4	+0.5563	0.5406	0.0852	+59	− 6
41	Libræ	5.3	3.15	5.8	19 2.2	**19** 2 34.5	+ 4 48.7	−0.0962	0.5414	0.0803	+18	−43
κ	Libræ	5.0	3.14	5.5	19 25.1	4 2.7	+ 6 14.2	+0.2112	0.5418	0.0780	+35	−25
λ	Libræ	5.1	3.13	4.5	19 55.6	9 31.8	+11 32.8	+0.3734	0.5431	0.0691	+44	−16
47	Libræ	5.8	+3.11	− 4.5	−19 8.8	10 20.8	−11 39.8	−0.5514	0.5433	−0.0678	− 8	−76
10 G.	Scorpii	5.9	3.15	4.0	20 45.0	11 36.4	−10 26.6	+1.1482	0.5436	0.0657	+70	+38
β	Scorpii	2.9	3.10	3.6	19 35.1	15 20.9	− 6 49.3	−0.3806	0.5444	0.0594	0	−62
56 B.	Scorpii	5.0	3.10	3.6	19 34.9	15 21.1	− 6 49.1	−0.3851	0.5444	0.0594	0	−62
ω^1	Scorpii	4.3	3.12	3.4	20 27.1	15 59.6	− 6 11.9	+0.5445	0.5446	0.0584	+55	− 6
ω^2	Scorpii	4.6	+3.13	− 3.3	−20 39.1	16 16.4	− 5 55.5	+0.7507	0.5446	−0.0579	+70	+ 6

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1919.0. Δα	Red'ns from 1919.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
ν Scorpii	3.9	+3.08	− 3.1	−19 15.1	19 18 29.6	− 3 46.6	−0.9301	0.5451	−0.0542	−32	−90
84 B. Scorpii	6.3	3.12	2.7	20 54.2	19 39.5	− 2 39.0	+0.8440	0.5454	0.0522	+70	+13
51 G. Scorpii	6.5	3.12	2.5	21 6.2	20 50.9	− 1 29.9	+1.0061	0.5456	0.0501	+69	+25
58 G. Scorpii	6.2	3.09	− 2.4	20 1.3	21 53.3	− 0 29.4	−0.2483	0.5458	−0.0483	+ 7	−52
				NEW	*MOON.*						
g Sagittarii	5.1	+2.95	+14.5	−15 42.2	24 5 54.5	+ 4 10.0	−0.5400	0.5418	+0.1279	− 1	−74
16 B. Capricorni	6.2	2.98	16.1	15 2.2	17 2.2	− 9 3.4	+0.2386	0.5395	0.1426	+44	−24
β Capricorni	3.2	2.98	16.1	15 2.0	17 9.1	− 8 56.7	+0.2517	0.5395	0.1427	+44	−23
27 G. Capricorni	6.2	3.00	16.5	15 19.4	22 4.8	− 4 10.3	+1.2850	0.5385	0.1488	+75	+53
45 B. Capricorni	6.1	+2.99	+17.0	−13 59.8	23 37.6	− 2 40.3	+0.0708	0.5382	+0.1506	+35	−33
84 B. Capricorni	6.0	3.02	18.0	12 50.4	25 7 46.0	+ 5 12.7	+0.0790	0.5367	0.1599	+36	−33
16 B. Aquarii	6.4	3.00	18.4	11 52.5	8 57.8	+ 6 22.4	−0.7758	0.5365	0.1612	−10	−90
ν Aquarii	4.5	3.04	19.2	11 41.7	17 7.9	− 9 42.7	+0.3806	0.5352	0.1695	+56	−16
51 G. Aquarii	6.5	3.04	19.5	10 56.1	19 28.1	− 7 26.8	−0.0420	0.5348	0.1717	+31	−39
17 Aquarii	6.3	+3.05	+20.2	− 9 39.6	23 47.2	− 3 15.6	−0.6692	0.5343	+0.1757	− 3	−86
19 Aquarii	5.6	3.07	20.0	10 5.3	26 0 54.9	− 2 10.1	−0.0077	0.5342	0.1766	+33	−37
ξ Aquarii	4.8	3.09	21.2	8 12.7	7 10.3	+ 3 53.7	−0.9063	0.5335	0.1818	−17	−90
c^1 Capricorni	5.3	3.12	21.1	9 26.9	10 46.9	+ 7 23.7	+1.0847	0.5332	0.1846	+81	+27
30 Aquarii	5.6	3.17	22.3	6 54.5	19 55.1	− 7 45.0	+0.0732	0.5328	0.1908	+40	−33
138 B. Aquarii	6.4	+3.19	+23.0	− 5 6.8	27 0 39.3	− 3 9.5	−0.9337	0.5328	+0.1936	−17	−90
44 Aquarii	5.7	3.22	23.0	5 47.1	2 49.9	− 1 2.8	+0.2062	0.5329	0.1947	+48	−26
51 Aquarii	5.8	3.25	23.2	5 14.5	6 19.5	+ 2 20.2	+0.3084	0.5331	0.1965	+55	−20
187 B. Aquarii	6.3	3.26	24.0	3 19.2	9 55.2	+ 5 49.2	−1.0274	0.5333	0.1981	−23	−90
κ Aquarii	5.2	3.30	23.5	4 38.4	13 7.3	+ 8 55.6	+1.0123	0.5335	0.1994	+86	+21
207 B. Aquarii	6.3	+3.32	+23.9	− 3 58.1	14 38.1	+10 23.5	+0.6018	0.5337	+0.1999	+77	− 4
6 G. Piscium	6.2	3.40	24.3	2 49.4	23 17.4	− 5 13.2	+1.1261	0.5350	0.2025	+88	+30
22 B. Piscium	6.4	3.54	25.3	− 0 8.8	28 11 42.7	+ 6 48.8	+0.8280	0.5378	0.2042	+90	+ 9
κ Piscium	4.9	3.56	25.4	+ 0 49.1	13 22.4	+ 8 25.4	+0.1529	0.5383	0.2042	+46	−29
9 Piscium	6.4	3.56	25.4	0 41.1	13 31.6	+ 8 34.2	+0.3256	0.5383	0.2042	+56	−19
16 Piscium	5.7	+3.60	+25.8	+ 1 39.6	17 58.7	−11 7.0	+0.2117	0.5397	+0.2041	+49	−25
λ Piscium	4.6	3.63	25.4	1 20.5	20 43.1	− 8 27.9	+1.1029	0.5406	0.2039	+90	+28
19 Piscium	5.4	3.67	26.0	3 2.7	22 48.7	− 6 26.3	−0.2510	0.5413	0.2036	+23	−51
22 Piscium	5.8	3.70	25.7	2 29.2	29 1 29.2	− 3 50.9	+0.8747	0.5423	0.2032	+90	+12
51 Piscium	5.6	3.99	25.9	6 30.9	20 35.0	− 9 22.3	+0.5150	0.5511	0.1965	+70	− 8
136 B. Piscium	6.5	+4.07	+26.3	+ 8 55.2	30 0 39.2	− 5 26.3	−1.1680	0.5533	+0.1942	−35	−82
δ Piscium	4.6	4.11	25.3	7 9.1	4 5.0	− 2 7.2	+1.3145	0.5553	0.1921	+84	+56
π Piscium	5.6	4.51	24.0	11 44.1	31 1 40.8	− 5 16.3	+0.5799	0.5692	0.1730	+77	− 1
12 H^1. Arietis	6.3	4.71	22.4	13 5.6	12 36.7	+ 5 16.0	+1.0191	0.5771	0.1595	+90	+29
19 Arietis	5.8	+4.84	+22.0	+14 54.4	17 0.4	+ 9 30.0	−0.1243	0.5803	+0.1534	+30	−37

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington.		Angle from—		Washington.		Angle from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Jan. 7	19 Piscium	5.4	1 39	6 33	88	54	2 44	7 38	214	171	1 5
10	27 Arietis	6.4	1 54	6 36	352	9	2 15	6 57	322	328	0 21
11	14 H¹. Tauri	6.5	6 22	11 0	32	338	7 5	11 42	319	263	0 43
11	22 H¹. Tauri	6.1	8 52	13 29	47	352	9 35	14 12	310	256	0 43
15	*f* Geminorum	5.3	5 26	9 48	138	185	6 34	10 56	253	283	1 8
19	*p*³ Leonis	6.1	7 0	11 6	147	195	8 3	12 9	266	308	1 3
Feb. 8	51 Tauri	5.6	4 36	7 24	84	69	5 59	8 46	266	219	1 23
8	56 Tauri	5.2	5 32	8 20	45	5	6 32	9 19	309	257	1 0
8	247 B. Tauri	5.8	9 40	12 27	75	19	10 34	13 21	291	238	0 54
9	108 Tauri	6.2	3 6	5 50	13	64	3 30	6 14	337	24	0 24
9	*n* Tauri	5.1	4 50	7 34	81	98	6 13	8 57	282	248	1 23
9	*o* Tauri	4.8	9 34	12 17	69	11	10 28	13 10	310	254	0 54
10	15 Geminorum	6.5	10 8	12 47	71	14	11 1	13 40	320	263	0 53
10	16 Geminorum	6.2	10 20	12 59	133	77	11 17	13 55	257	201	0 56
12	29 Cancri ‡	5.9	15 8	17 39	64	14	15 44	18 14	334	287	0 35
14	14 Sextantis	6.3	14 29	16 52	93	42	15 27	17 49	318	266	0 57
15	237 B. Leonis	6.3	13 24	15 43	115	76	14 38	16 56	303	256	1 14
15	55 Leonis	6.1	15 39	17 57	77	27	16 28	18 46	331	280	0 49
21	147 B. Libræ †	6.2	10 14	12 10	78	129	11 11	13 7	319	4	0 57
Mar. 6	54 Arietis	6.5	9 5	10 10	95	42	9 57	11 2	255	206	0 52
8	*ι* Tauri	4.7	6 6	7 3	137	100	7 4	8 1	229	178	0 58
8	105 Tauri	6.0	8 34	9 31	88	31	9 40	10 37	28[illegible]	229	1 6
11	2 B. Cancri	6.0	7 47	8 32	75	78	8 54	9 39	331	303	1 7
12	*α* Cancri	4.3	13 16	13 57	66	13	13 57	14 37	343	290	0 41
20	*ι* Libræ	4.7	10 23	10 32	91	139	11 29	11 38	309	350	1 6
24	128 B. Sagittarii	6.3	13 59	13 52	96	143	15 10	15 3	260	300	1 11
Apr. 8	*A*¹ Cancri	5.5	13 20	12 14	105	52	14 19	13 14	300	248	0 59
9	*ω* Leonis	5.5	10 32	9 23	127	102	11 53	10 44	294	251	1 21
11	*p*³ Leonis	6.1	11 18	10 1	104	98	12 39	11 22	321	293	1 21
21	226 B. Sagittarii	6.4	16 7	14 10	70	107	17 28	15 31	270	294	1 21
May 4	162 B. Geminorum ‡	5.7	13 48	11 0	109	57	14 39	11 51	284	236	0 51
8	237 B. Leonis	6.3	14 3	10 59	52	8	14 33	11 29	2	316	0 30
14	147 B. Libræ	6.2	11 52	8 25	152	193	12 47	9 20	246	278	0 55
14	172 B. Libræ	5.9	16 59	13 31	99	80	18 27	14 59	274	240	1 28
17	14 Sagittarii	5.6	17 8	13 29	89	102	18 41	15 1	255	248	1 32
18	195 B. Sagittarii	6.3	19 38	15 54	102	94	20 52	17 8	220	197	1 14
26	19 Arietis	5.8	20 0	15 44	66	118	20 52	16 37	254	308	0 53
June 2	60 Cancri	5.7	13 38	8 56	70	17	14 21	9 39	336	284	0 43
15	267 B. Sagittarii †	5.8	14 25	8 52	48	97	15 20	9 47	298	343	0 55
16	27 G. Capricorni	6.2	15 53	10 16	87	134	17 4	11 26	244	284	1 10
23	*π* Arietis	5.2	21 12	15 6	57	110	22 6	16 1	265	320	0 54
29	84 B. Cancri ‡	6.4	15 6	8 38	83	32	15 51	9 22	315	267	0 45
July 12	226 B. Sagittarii	6.4	15 38	8 18	76	117	16 56	9 36	267	297	1 18
18	51 Piscium	5.6	18 11	10 28	90	141	19 3	11 19	224	276	0 51
21	175 B. Arietis	6.4	21 2	13 6	116	168	21 42	13 46	212	266	0 40
23	*ζ* Tauri	3.0	0 9	16 5	55	110	1 0	16 56	295	352	0 51
Aug. 7	14 Sagittarii	5.6	20 39	11 37	142	111	21 12	12 9	190	154	0 32

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.
† Immersion below the horizon of Washington. ‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington.		Angle from—		Washington.		Angle from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Aug. 11	c^1 Capricorni	5.3	20 44	11 25	80	94	22 2	12 43	222	216	1 18
12	κ Aquarii	5.2	21 30	12 8	107	124	22 24	13 2	191	193	0 54
12	207 B. Aquarii	6.3	23 48	14 25	64	44	1 3	15 40	234	199	1 15
13	22 B. Piscium	6.4	17 55	8 30	64	116	18 56	9 30	249	298	1 0
13	16 Piscium	5.7	2 17	16 50	57	16	3 26	17 59	250	202	1 9
17	53 Arietis	6.0	20 18	10 36	66	116	21 9	11 27	262	315	0 51
18	ω Tauri	4.8	0 49	15 2	50	106	1 52	16 6	283	335	1 3
31	25 Libræ	6.0	17 6	6 30	127	101	18 22	7 46	251	213	1 16
Sept. 5	267 B. Sagittarii	5.8	20 43	9 46	91	75	21 58	11 1	226	195	1 15
8	51 Aquarii ‡	5.8	3 29	16 19	40	350	4 20	17 10	273	221	0 51
16	χ^1 Orionis †	4.5	22 20	10 40	81	127	23 10	11 30	273	324	0 50
16	χ^2 Orionis	4.7	2 29	14 48	137	193	3 18	15 37	221	274	0 49
18	1 Cancri	6.0	1 34	13 46	110	162	2 31	14 42	266	320	0 56
Oct. 1	21 Sagittarii ‡	5.0	22 31	9 52	57	13	23 34	10 54	274	223	1 3
2	*d* Sagittarii	5.0	23 17	10 34	146	102	23 35	10 52	176	130	0 18
5	c^1 Capricorni	5.3	18 27	5 33	98	138	19 33	6 38	215	245	1 6
6	κ Aquarii	5.2	19 1	6 3	91	135	20 6	7 7	217	252	1 5
6	207 B. Aquarii	6.3	21 18	8 19	36	57	22 30	9 31	264	266	1 12
8	51 Piscium	5.6	23 6	10 0	64	91	0 23	11 16	238	240	1 16
13	372 B. Tauri †	6.1	22 15	8 48	36	84	22 48	9 21	314	5	0 33
16	84 B. Cancri †	6.4	1 17	11 38	101	150	2 11	12 32	280	331	0 54
16	A^1 Cancri	5.5	6 4	16 24	107	154	7 25	17 46	293	323	1 21
17	ω Leonis †	5.5	2 48	13 5	114	165	3 44	14 2	276	329	0 57
Nov. 2	44 Aquarii	5.7	23 9	8 24	346	330	23 32	8 47	313	292	0 23
2	51 Aquarii	5.8	2 52	12 7	82	34	3 50	13 4	230	179	0 58
7	124 B. Arietis	6.4	20 35	5 31	136	187	20 59	5 55	190	243	0 24
7	53 Arietis	6.0	3 19	12 13	68	60	4 35	13 30	264	224	1 16
8	43 Tauri	5.5	1 49	10 40	130	180	2 34	11 24	205	246	0 45
9	*l* Tauri	5.2	23 1	7 49	66	120	23 53	8 41	278	334	0 52
10	68 Orionis	5.7	23 19	8 3	65	115	0 7	8 50	292	346	0 48
11	162 B. Geminorum	5.7	8 54	17 32	54	16	9 36	18 14	346	300	0 42
14	14 Sextantis	6.3	5 6	13 33	123	175	6 12	14 38	279	328	1 6
27	16 B. Capricorni	6.2	23 35	7 12	19	340	0 24	8 1	293	248	0 49
27	β Capricorni	3.2	23 40	7 17	26	345	0 34	8 11	287	241	0 54
28	ν Aquarii	4.5	23 14	6 47	49	20	0 29	8 1	256	215	1 15
29	30 Aquarii	5.6	2 38	10 6	33	345	3 30	10 58	278	228	0 52
Dec. 2	51 Piscium	5.6	0 2	7 18	89	99	1 12	8 29	213	197	1 10
7	χ^1 Orionis	4.5	6 56	13 52	86	51	8 8	15 4	292	241	1 12
7	64 Orionis	5.1	11 15	18 11	122	67	12 5	19 0	259	207	0 50
9	1 Cancri	6.0	5 17	12 5	77	126	6 24	13 13	313	350	1 8
10	A^2 Cancri	5.7	2 2	8 47	139	190	2 45	9 30	244	297	0 43
10	60 Cancri	5.7	6 20	13 4	116	161	7 38	14 22	287	316	1 18
13	388 B. Leonis	6.3	6 17	12 50	55	106	6 51	13 24	353	42	0 34
18	11 H. Libræ †	5.4	10 16	16 29	106	156	11 23	17 35	289	334	1 6
28	9 Piscium	6.4	3 41	9 15	64	15	4 44	10 18	250	198	1 3
28	κ Piscium	4.9	3 46	9 20	27	338	4 36	10 9	287	236	0 49

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.
† Immersion below the horizon of Washington. ‡ Emersion below the horizon of Washington.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE SUN.

FOR GREENWICH MEAN NOON.

Date.	P	B_0	L_0	Date.	P	B_0	L_0
	°	°	°		°	°	°
Jan. 1	+ 2.23	−3.10	247.64	July 5	− 1.10	+3.37	325.87
6	− 0.20	3.67	181.79	10	+ 1.17	3.89	259.70
11	2.62	4.21	115.94	15	3.42	4.38	193.53
16	5.00	4.72	50.10	20	5.64	4.85	127.37
21	7.31	5.19	344.27	25	7.79	5.28	61.22
26	− 9.54	−5.62	278.44	30	+ 9.87	+5.68	355.09
31	11.68	6.00	212.60	Aug. 4	11.87	6.03	288.96
Feb. 5	13.70	6.34	146.77	9	13.78	6.35	222.85
10	15.60	6.62	80.94	14	15.58	6.62	156.75
15	17.37	6.86	15.10	19	17.26	6.85	90.66
20	−19.00	−7.04	309.26	24	+18.83	+7.02	24.59
25	20.48	7.16	243.40	29	20.27	7.15	318.53
Mar. 2	21.80	7.23	177.54	Sept. 3	21.57	7.23	252.48
7	22.97	7.25	111.67	8	22.73	7.25	186.45
12	23.97	7.21	45.78	13	23.74	7.22	120.43
17	−24.81	−7.11	339.88	18	+24.60	+7.14	54.42
22	25.48	6.96	273.96	23	25.30	7.01	348.42
27	25.97	6.76	208.02	28	25.84	6.83	282.43
Apr. 1	26.28	6.51	142.07	Oct. 3	26.21	6.59	216.46
6	26.42	6.21	76.10	8	26.40	6.31	150.49
11	−26.37	−5.87	10.10	13	+26.40	+5.97	84.53
16	26.14	5.48	304.08	18	26.22	5.60	18.57
21	25.73	5.06	238.04	23	25.85	5.17	312.63
26	25.13	4.60	171.99	28	25.29	4.71	246.69
May 1	24.34	4.11	105.92	Nov. 2	24.53	4.22	180.76
6	−23.38	−3.59	39.82	7	+23.57	+3.68	114.84
11	22.24	3.05	333.71	12	22.41	3.12	48.91
16	20.93	2.48	267.59	17	21.07	2.54	343.00
21	19.46	1.90	201.44	22	19.53	1.93	277.10
26	17.83	1.31	135.29	27	17.82	1.31	211.20
31	−16.06	−0.71	69.13	Dec. 2	+15.95	+0.68	145.30
June 5	14.16	−0.11	2.96	7	13.93	+0.04	79.41
10	12.16	+0.49	296.78	12	11.78	−0.60	13.53
15	10.06	1.09	230.60	17	9.52	1.24	307.65
20	7.88	1.68	164.42	22	7.18	1.87	241.79
25	− 5.65	+2.26	98.23	27	+ 4.78	−2.48	175.93
30	− 3.38	+2.83	32.05	32	+ 2.35	−3.07	110.07

In the above table, P is the position-angle of the axis of rotation measured eastward from the north point of the disk, while L_0 and B_0 are the heliographic longitudes and latitudes, respectively, of the center of the disk. The longitudes are reckoned from the Solar Meridian which passed through the ascending node of the Sun's equator on the ecliptic, on January 1, 1854, Greenwich Mean Noon.

MEAN EQUATOR, ORBIT, AND MEAN LONGITUDE.

FOR GREENWICH MEAN NOON.

Date.		Mean Equator.			Orbit.		Mean Longitude.
		i	Δ	☊′	♈′	☊	☾
		° ′	° ′	° ′	° ′	° ′	° ′
Jan.	0	23 58.3	68 27.0	3 35.4	27 21.6	251 44.0	261 27.9
	10	23 59.1	67 56.0	3 34.6	28 28.4	251 12.2	33 13.7
	20	23 59.9	67 25.0	3 33.8	29 35.2	250 40.4	164 59.6
	30	24 0.7	66 53.9	3 33.0	30 42.1	250 8.7	296 45.4
Feb.	9	24 1.4	66 22.9	3 32.2	31 48.9	249 36.9	68 31.2
	19	24 2.2	65 52.0	3 31.3	32 55.8	249 5.1	200 17.1
Mar.	1	24 3.0	65 21.0	3 30.5	34 2.6	248 33.3	332 2.9
	11	24 3.8	64 50.0	3 29.6	35 9.4	248 1.6	103 48.8
	21	24 4.6	64 19.0	3 28.7	36 16.3	247 29.8	235 34.6
	31	24 5.3	63 48.1	3 27.8	37 23.1	246 58.0	7 20.4
Apr.	10	24 6.1	63 17.2	3 26.8	38 30.0	246 26.2	139 6.3
	20	24 6.8	62 46.3	3 25.9	39 36.8	245 54.5	270 52.1
	30	24 7.6	62 15.4	3 24.9	40 43.7	245 22.7	42 38.0
May	10	24 8.3	61 44.5	3 24.0	41 50.5	244 50.9	174 23.8
	20	24 9.1	61 13.7	3 23.0	42 57.3	244 19.2	306 9.6
	30	24 9.8	60 42.8	3 22.0	44 4.2	243 47.4	77 55.5
June	9	24 10.5	60 12.0	3 20.9	45 11.0	243 15.6	209 41.3
	19	24 11.3	59 41.2	3 19.9	46 17.9	242 43.8	341 27.1
	29	24 12.0	59 10.4	3 18.8	47 24.7	242 12.1	113 13.0
July	9	24 12.7	58 39.6	3 17.8	48 31.6	241 40.3	244 58.8
	19	24 13.5	58 8.9	3 16.7	49 38.4	241 8.5	16 44.7
	29	24 14.2	57 38.1	3 15.6	50 45.2	240 36.7	148 30.5
Aug.	8	24 14.9	57 7.4	3 14.5	51 52.1	240 5.0	280 16.3
	18	24 15.6	56 36.6	3 13.3	52 58.9	239 33.2	52 2.2
	28	24 16.3	56 5.9	3 12.2	54 5.8	239 1.4	183 48.0
Sept.	7	24 17.0	55 35.2	3 11.0	55 12.6	238 29.7	315 33.8
	17	24 17.7	55 4.5	3 9.8	56 19.5	237 57.9	87 19.7
	27	24 18.4	54 33.8	3 8.6	57 26.3	237 26.1	219 5.5
Oct.	7	24 19.1	54 3.2	3 7.4	58 33.1	236 54.3	350 51.4
	17	24 19.8	53 32.5	3 6.2	59 40.0	236 22.6	122 37.2
	27	24 20.5	53 1.9	3 5.0	60 46.8	235 50.8	254 23.0
Nov.	6	24 21.2	52 31.2	3 3.7	61 53.7	235 19.0	26 8.9
	16	24 21.8	52 0.6	3 2.5	63 0.5	234 47.3	157 54.7
	26	24 22.5	51 30.0	3 1.2	64 7.3	234 15.5	289 40.6
Dec.	6	24 23.1	50 59.5	2 59.9	65 14.2	233 43.7	61 26.4
	16	24 23.8	50 28.9	2 58.6	66 21.0	233 11.9	193 12.2
	26	24 24.4	49 58.3	2 57.3	67 27.9	232 40.2	324 58.1
	36	24 25.1	49 27.8	2 56.0	68 34.7	232 8.4	96 43.9

Mean Solar Days.	Motion in Mean Longitude.
	° ′
0.1	1 19.06
0.2	2 38.12
0.3	3 57.18
0.4	5 16.23
0.5	6 35.29
0.6	7 54.35
0.7	9 13.41
0.8	10 32.47
0.9	11 51.53
1.0	13 10.58
2.0	26 21.17
3.0	39 31.75
4.0	52 42.33
5.0	65 52.92
6.0	79 3.50
7.0	92 14.09
8.0	105 24.67
9.0	118 35.25
10.0	131 45.84
Hours.	° ′
1	0 32.94
2	1 5.88
3	1 38.82
4	2 11.76
5	2 44.70
6	3 17.65
7	3 50.59
8	4 23.53
9	4 56.47
10	5 29.41
11	6 2.35
12	6 35.29
13	7 8.23
14	7 41.17
15	8 14.11
16	8 47.06
17	9 20.00
18	9 52.94
19	10 25.88
20	10 58.82
21	11 31.76
22	12 4.70
23	12 37.64

Daily motion of ♈′ . . . . . . +6′.684
Daily motion of ☊ . . . . . . −3′.177

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Jan.	1	−4.91	−2.70	0.00	+0.03	270.69	+0.71	358.69
	2	5.11	4.02	0.00	0.03	282.87	0.73	353.20
	3	5.03	5.15	0.00	0.03	295.06	0.75	348.10
	4	4.70	6.02	0.00	0.03	307.25	0.78	343.65
	5	4.15	6.55	0.00	0.03	319.43	0.80	340.06
	6	−3.44	−6.71	0.00	+0.03	331.60	+0.82	337.49
	7	2.60	6.47	0.00	0.03	343.77	0.85	336.10
	8	1.68	5.84	0.00	0.03	355.94	0.88	336.01
	9	−0.71	4.85	0.00	0.03	8.10	0.91	337.32
	10	+0.28	3.57	0.00	0.03	20.24	0.94	340.07
	11	+1.26	−2.06	0.00	+0.03	32.39	+0.97	344.17
	12	2.20	−0.43	0.00	0.03	44.52	1.00	349.37
	13	3.08	+1.22	0.00	0.03	56.66	1.04	355.27
	14	3.84	2.79	+0.01	0.03	68.78	1.07	1.37
	15	4.44	4.16	0.01	0.03	80.91	1.10	7.18
	16	+4.82	+5.28	+0.01	+0.03	93.04	+1.12	12.35
	17	4.94	6.09	0.01	0.03	105.16	1.15	16.68
	18	4.77	6.56	+0.01	0.03	117.29	1.17	20.04
	19	4.29	6.69	0.00	0.03	129.43	1.19	22.41
	20	3.52	6.51	0.00	0.03	141.57	1.21	23.78
	21	+2.50	+6.04	0.00	+0.03	153.71	+1.22	24.15
	22	+1.28	5.31	0.00	0.03	165.86	1.23	23.51
	23	−0.05	4.36	0.00	0.03	178.02	1.24	21.88
	24	1.41	3.22	0.00	0.03	190.18	1.25	19.25
	25	2.72	1.95	0.00	0.03	202.35	1.26	15.69
	26	−3.87	+0.56	0.00	+0.03	214.52	+1.27	11.28
	27	4.80	−0.87	0.00	0.03	226.70	1.27	6.21
	28	5.41	2.28	0.00	0.02	238.89	1.28	0.74
	29	5.66	3.62	−0.01	0.02	251.08	1.29	355.16
	30	5.54	4.80	0.01	0.02	263.27	1.30	349.82
	31	−5.04	−5.73	−0.01	+0.02	275.46	+1.31	345.02
Feb.	1	4.24	6.34	0.01	0.02	287.65	1.32	341.04
	2	3.20	6.57	0.01	0.02	299.85	1.33	338.07
	3	2.03	6.39	0.01	0.02	312.03	1.34	336.31
	4	−0.83	5.82	0.01	0.02	324.22	1.36	335.89
	5	+0.32	−4.87	−0.01	+0.02	336.40	+1.37	336.89
	6	1.36	3.63	0.00	0.02	348.57	1.39	339.34
	7	2.25	2.18	0.00	0.02	0.73	1.40	343.13
	8	2.99	−0.60	0.00	0.02	12.89	1.42	348.03
	9	3.59	+0.99	0.00	0.02	25.05	1.44	353.68
	10	+4.05	+2.51	0.00	+0.02	37.19	+1.46	359.63
	11	4.38	3.87	0.00	0.02	49.33	1.48	5.44
	12	4.56	5.00	0.00	0.02	61.47	1.50	10.74
	13	4.58	5.84	0.00	0.03	73.61	1.51	15.31
	14	4.41	6.37	0.00	0.03	85.74	1.53	19.00
	15	+4.02	+6.57	0.00	+0.03	97.88	+1.54	21.72
	16	+3.38	+6.45	0.00	+0.03	110.02	+1.55	23.45

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		*C*
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
Feb. 16	+3.38	+6.45	0.00	+0.03	110.02	+1.55	23.45
17	2.52	6.03	0.00	0.03	122.16	1.55	24.17
18	1.44	5.34	0.00	0.03	134.30	1.55	23.86
19	+0.20	4.43	−0.01	0.03	146.46	1.55	22.55
20	−1.16	3.33	0.01	0.02	158.61	1.55	20.24
21	−2.56	+2.10	−0.01	+0.02	170.77	+1.55	17.00
22	3.89	+0.76	0.01	0.02	182.94	1.54	12.90
23	5.08	−0.62	0.01	0.02	195.11	1.54	8.11
24	6.01	2.01	0.01	0.02	207.29	1.53	2.84
25	6.60	3.32	0.01	0.02	219.48	1.52	357.34
26	−6.77	−4.51	−0.01	+0.02	231.67	+1.52	351.93
27	6.49	5.49	0.01	0.02	243.87	1.51	346.89
28	5.76	6.18	0.01	0.02	256.07	1.51	342.52
Mar. 1	4.61	6.50	0.01	0.02	268.28	1.50	339.07
2	3.16	6.41	0.01	0.02	280.48	1.50	336.78
3	−1.54	−5.90	−0.01	+0.02	292.69	+1.50	335.85
4	+0.10	4.98	0.01	0.02	304.89	1.49	336.41
5	1.62	3.74	0.01	0.02	317.09	1.49	338.51
6	2.93	2.26	0.01	0.02	329.28	1.49	342.07
7	3.98	−0.67	0.01	0.02	341.47	1.49	346.82
8	+4.74	+0.93	−0.01	+0.02	353.65	+1.50	352.39
9	5.23	2.46	0.01	0.02	5.83	1.50	358.31
10	5.48	3.81	0.01	0.02	18.00	1.50	4.14
11	5.53	4.94	0.01	0.02	30.16	1.51	9.52
12	5.37	5.80	0.01	0.02	42.32	1.51	14.22
13	+5.04	+6.34	−0.01	+0.02	54.48	+1.51	18.10
14	4.54	6.57	0.01	0.02	66.63	1.51	21.07
15	3.86	6.48	0.01	0.02	78.78	1.51	23.08
16	3.00	6.09	0.01	0.02	90.93	1.50	24.09
17	1.97	5.43	0.01	0.02	103.08	1.49	24.09
18	+0.78	+4.53	−0.01	+0.02	115.24	+1.48	23.07
19	−0.53	3.44	0.01	0.02	127.40	1.47	21.05
20	1.93	2.21	0.01	0.02	139.56	1.45	18.07
21	3.34	+0.89	0.01	0.02	151.72	1.44	14.24
22	4.70	−0.49	0.01	0.02	163.90	1.42	9.69
23	−5.90	−1.86	−0.02	+0.02	176.08	+1.40	4.62
24	6.86	3.17	0.02	0.02	188.26	1.38	359.28
25	7.49	4.36	0.02	0.02	200.45	1.36	353.93
26	7.70	5.37	0.02	0.02	212.65	1.35	348.83
27	7.43	6.12	0.02	0.02	224.86	1.33	344.24
28	−6.67	−6.54	−0.02	+0.02	237.07	+1.31	340.42
29	5.43	6.56	0.02	0.02	249.28	1.29	337.60
30	3.82	6.16	0.02	0.02	261.50	1.27	336.04
31	−1.94	5.33	0.02	0.02	273.72	1.26	335.95
Apr. 1	+0.01	4.12	0.01	0.02	285.95	1.24	337.48
2	+1.88	−2.62	−0.01	+0.02	298.17	+1.22	340.61
3	+3.53	−0.96	−0.01	+0.02	310.39	+1.21	345.[illegible]

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Apr.	1	+0.01	–4.12	–0.01	+0.02	285.95	+1.24	337.48
	2	1.88	2.62	0.01	0.02	298.17	1.22	340.61
	3	3.53	–0.96	0.01	0.02	310.39	1.21	345.15
	4	4.86	+0.73	0.01	0.02	322.60	1.19	350.70
	5	5.84	2.34	0.01	0.02	334.80	1.18	356.74
	6	+6.45	+3.77	–0.01	+0.02	347.00	+1.17	2.75
	7	6.71	4.96	0.01	0.02	359.20	1.16	8.34
	8	6.66	5.85	0.01	0.02	11.39	1.15	13.24
	9	6.34	6.43	0.01	0.02	23.57	1.14	17.31
	10	5.78	6.68	0.01	0.02	35.75	1.12	20.48
	11	+5.02	+6.62	–0.01	+0.02	47.92	+1.11	22.71
	12	4.10	6.26	0.01	0.02	60.10	1.10	23.96
	13	3.02	5.61	0.01	0.02	72.27	1.08	24.22
	14	1.81	4.73	0.01	0.02	84.44	1.06	23.47
	15	+0.50	3.65	0.01	0.02	96.61	1.04	21.71
	16	–0.87	+2.41	–0.01	+0.02	108.78	+1.02	18.97
	17	2.28	+1.07	0.01	0.02	120.95	0.99	15.34
	18	3.67	–0.32	0.01	0.02	133.13	0.97	10.97
	19	4.98	1.71	0.01	0.02	145.31	0.94	6.04
	20	6.14	3.03	0.02	0.02	157.50	0.92	0.80
	21	–7.08	–4.25	–0.02	+0.02	169.69	+0.89	355.51
	22	7.72	5.29	0.02	0.02	181.88	0.86	350.42
	23	7.97	6.09	0.02	0.02	194.09	0.83	345.75
	24	7.80	6.60	0.02	0.02	206.30	0.80	341.74
	25	7.15	6.74	0.02	0.02	218.52	0.78	338.58
	26	–6.08	–6.48	–0.02	+0.02	230.74	+0.75	336.51
	27	4.51	5.80	0.02	0.02	242.97	0.72	335.76
	28	2.67	4.71	0.01	0.02	255.21	0.70	336.55
	29	–0.67	3.27	0.01	0.02	267.44	0.67	338.98
	30	+1.34	–1.60	0.01	0.02	279.68	0.64	343.02
May	1	+3.21	+0.18	–0.01	+0.02	291.92	+0.62	348.35
	2	4.80	1.92	0.01	0.02	304.16	0.60	354.46
	3	6.02	3.49	0.01	0.02	316.38	0.58	0.75
	4	6.84	4.80	0.01	0.02	328.61	0.55	6.70
	5	7.25	5.80	0.01	0.02	340.83	0.53	11.97
	6	+7.27	+6.46	–0.01	+0.02	353.04	+0.51	16.37
	7	6.93	6.78	0.01	0.02	5.25	0.49	19.82
	8	6.29	6.77	0.01	0.02	17.45	0.47	22.30
	9	5.40	6.45	0.01	0.02	29.65	0.45	23.79
	10	4.32	5.85	0.01	0.02	41.84	0.43	24.29
	11	+3.09	+4.99	–0.01	+0.02	54.03	+0.40	23.79
	12	1.76	3.93	0.01	0.02	66.22	0.38	22.28
	13	+0.38	2.70	0.01	0.02	78.40	0.35	19.78
	14	–1.02	+1.36	0.01	0.02	90.59	0.32	16.35
	15	2.39	–0.05	0.01	0.02	102.77	0.30	12.12
	16	–3.68	–1.46	–0.01	+0.02	114.96	+0.27	7.29
	17	–4.87	–2.82	–0.01	+0.01	127.14	+0.24	2.09

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
May	17	−4.87	−2.82	−0.01	+0.01	127.14	+0.24	2.09
	18	5.88	4.07	0.01	0.01	139.34	0.21	356.79
	19	6.69	5.15	0.01	0.01	151.54	0.18	351.66
	20	7.22	6.00	0.01	0.01	163.74	0.15	346.92
	21	7.44	6.58	0.01	0.01	175.94	0.12	342.78
	22	−7.31	−6.82	−0.01	+0.01	188.16	+0.09	339.43
	23	6.78	6.68	0.01	0.01	200.38	0.06	337.05
	24	5.87	6.15	0.01	0.01	212.61	+0.03	335.84
	25	4.59	5.22	0.01	0.01	224.84	0.00	336.00
	26	3.01	3.92	0.01	0.01	237.08	−0.03	337.70
	27	−1.22	−2.34	−0.01	+0.01	249.33	−0.06	341.01
	28	+0.66	−0.59	−0.01	0.01	261.58	0.08	345.80
	29	2.49	+1.20	0.00	0.01	273.82	0.11	351.68
	30	4.14	2.89	0.00	0.01	286.07	0.14	358.08
	31	5.50	4.36	0.00	0.01	298.32	0.17	4.39
June	1	+6.48	+5.52	0.00	+0.01	310.56	−0.19	10.13
	2	7.04	6.32	0.00	0.01	322.80	0.22	15.00
	3	7.18	6.75	0.00	0.01	335.04	0.24	18.88
	4	6.90	6.83	0.00	0.01	347.26	0.27	21.71
	5	6.28	6.57	0.00	0.01	359.48	0.29	23.51
	6	+5.35	+6.03	0.00	+0.01	11.70	−0.31	24.29
	7	4.21	5.22	0.00	0.01	23.91	0.34	24.05
	8	2.90	4.20	0.00	0.01	36.12	0.36	22.79
	9	1.52	3.01	0.00	0.01	48.32	0.38	20.54
	10	+0.12	1.69	0.00	0.01	60.52	0.41	17.35
	11	−1.24	+0.29	0.00	+0.01	72.71	−0.44	13.30
	12	2.52	−1.13	0.00	0.01	84.90	0.46	8.58
	13	3.66	2.51	−0.01	0.01	97.10	0.49	3.40
	14	4.62	3.79	0.01	0.01	109.29	0.52	358.06
	15	5.39	4.91	0.01	0.01	121.48	0.54	352.81
	16	−5.93	−5.82	−0.01	+0.01	133.68	−0.57	347.94
	17	6.24	6.44	0.01	0.01	145.88	0.59	343.64
	18	6.28	6.75	0.01	0.01	158.09	0.62	340.12
	19	6.06	6.70	0.01	0.01	170.30	0.64	337.52
	20	5.57	6.27	−0.01	0.01	182.52	0.67	336.01
	21	−4.80	−5.47	0.00	+0.01	194.74	−0.69	335.76
	22	3.78	4.32	0.00	0.01	206.98	0.72	336.92
	23	2.52	2.88	0.00	0.01	219.21	0.74	339.59
	24	−1.09	−1.23	0.00	0.01	231.46	0.77	343.73
	25	+0.46	+0.51	0.00	0.01	243.71	0.79	349.12
	26	+2.03	+2.22	0.00	+0.01	255.96	−0.82	355.32
	27	3.50	3.76	0.00	0.01	268.22	0.84	1.74
	28	4.77	5.04	+0.01	0.01	280.47	0.86	7.82
	29	5.74	5.99	0.01	0.01	292.72	0.89	13.17
	30	6.34	6.55	0.01	0.01	304.97	0.91	17.55
July	1	+6.53	+6.74	+0.01	+0.01	317.22	−0.93	20.85
	2	+6.31	+6.58	+0.01	+0.01	329.46	−0.95	23.06

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT

Date.		The Earth's Selenographic— Long.	Lat.	Physical Libration. Long.	Lat.	The Sun's Selenographic— Colong.	Lat.	c
		°	°	°	°	°	°	°
July	1	+6.53	+6.74	+0.01	+0.01	317.22	−0.93	20.85
	2	6.31	6.58	0.01	0.01	329.46	0.95	23.06
	3	5.71	6.10	0.01	0.01	341.69	0.97	24.18
	4	4.80	5.36	+0.01	0.01	353.92	0.99	24.25
	5	3.64	4.38	0.00	0.01	6.14	1.01	23.29
	6	+2.31	+3.24	0.00	+0.01	18.36	−1.03	21.31
	7	+0.92	1.96	0.00	0.01	30.57	1.05	18.38
	8	−0.47	+0.59	0.00	0.01	42.78	1.07	14.56
	9	1.76	−0.80	0.00	0.01	54.98	1.09	10.01
	10	2.91	2.18	0.00	0.01	67.18	1.11	4.92
	11	−3.86	−3.48	0.00	+0.01	79.37	−1.13	359.55
	12	4.56	4.62	0.00	0.01	91.56	1.14	354.20
	13	5.01	5.57	0.00	0.01	103.76	1.16	349.13
	14	5.20	6.24	0.00	0.01	115.95	1.18	344.60
	15	5.15	6.60	0.00	0.01	128.15	1.19	340.83
	16	−4.88	−6.60	0.00	+0.01	140.34	−1.21	337.98
	17	4.43	6.23	0.00	0.01	152.55	1.22	336.22
	18	3.81	5.50	0.00	0.01	164.76	1.24	335.68
	19	3.05	4.44	0.00	0.01	176.97	1.25	336.49
	20	2.16	3.10	+0.01	0.01	189.19	1.26	338.73
	21	−1.16	−1.56	+0.01	+0.01	201.42	−1.28	342.37
	22	−0.07	+0.10	0.01	0.01	213.66	1.29	347.27
	23	+1.09	1.75	0.01	0.01	225.90	1.31	353.10
	24	2.27	3.29	0.01	0.01	238.14	1.32	359.36
	25	3.39	4.61	0.01	0.01	250.39	1.34	5.54
	26	+4.37	+5.63	+0.01	+0.01	262.64	−1.36	11.18
	27	5.13	6.30	0.01	0.01	274.90	1.37	15.96
	28	5.59	6.59	0.01	0.01	287.15	1.38	19.73
	29	5.69	6.52	0.01	0.01	299.40	1.40	22.39
	30	5.43	6.12	0.01	0.01	311.64	1.41	23.93
	31	+4.81	+5.42	+0.01	+0.01	323.88	−1.42	24.37
Aug.	1	3.88	4.50	0.01	0.01	336.11	1.44	23.74
	2	2.70	3.38	0.01	0.01	348.34	1.45	22.06
	3	+1.37	2.14	0.01	0.01	0.56	1.46	19.41
	4	−0.02	+0.81	0.01	0.01	12.78	1.47	15.86
	5	−1.39	−0.57	+0.01	+0.01	24.99	−1.48	11.54
	6	2.64	1.92	0.01	+0.01	37.19	1.48	6.62
	7	3.68	3.21	0.01	0.00	49.39	1.49	1.32
	8	4.46	4.37	0.01	0.00	61.58	1.50	355.92
	9	4.92	5.34	0.01	0.00	73.77	1.50	350.70
	10	−5.06	−6.06	+0.01	0.00	85.96	−1.51	345.91
	11	4.88	6.47	0.01	0.00	98.14	1.51	341.82
	12	4.42	6.52	0.01	0.00	110.33	1.51	338.63
	13	3.74	6.20	0.01	0.00	122.52	1.51	336.53
	14	2.91	5.51	0.01	0.00	134.70	1.51	335.67
	15	−2.01	−4.47	+0.01	0.00	146.90	−1.51	336.17
	16	−1.07	−3.16	+0.01	0.00	159.10	−1.51	338.11

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Aug.	16	−1.07	−3.16	+0.01	0.00	159.10	−1.51	338.11
	17	−0.14	1.65	0.01	0.00	171.30	1.51	341.44
	18	+0.77	−0.04	0.01	0.00	183.51	1.51	346.03
	19	1.65	+1.57	0.02	0.00	195.73	1.51	351.56
	20	2.50	3.07	0.02	0.00	207.96	1.51	357.61
	21	+3.30	+4.39	+0.02	0.00	220.19	−1.52	3.72
	22	4.01	5.43	0.02	0.00	232.43	1.52	9.44
	23	4.60	6.15	0.02	0.00	244.66	1.52	14.46
	24	5.00	6.50	0.02	0.00	256.91	1.52	18.55
	25	5.16	6.50	0.02	0.00	269.15	1.53	21.59
	26	+5.04	+6.16	+0.02	0.00	281.39	−1.53	23.54
	27	4.61	5.51	0.02	0.00	293.63	1.53	24.37
	28	3.88	4.61	0.02	0.00	305.86	1.53	24.09
	29	2.88	3.52	0.02	0.00	318.10	1.53	22.75
	30	1.66	2.28	0.02	0.00	330.32	1.53	20.40
	31	+0.30	+0.96	+0.02	0.00	342.54	−1.53	17.12
Sept.	1	−1.11	−0.40	0.01	0.00	354.76	1.53	13.04
	2	2.48	1.75	0.01	0.00	6.96	1.53	8.33
	3	3.72	3.03	0.01	0.00	19.17	1.52	3.18
	4	4.72	4.20	0.01	0.00	31.36	1.52	357.84
	5	−5.41	−5.20	+0.01	0.00	43.55	−1.51	352.56
	6	5.73	5.97	0.01	0.00	55.73	1.51	347.61
	7	5.65	6.44	0.01	0.00	67.91	1.50	343.22
	8	5.18	6.56	0.01	0.00	80.09	1.49	339.64
	9	4.37	6.31	0.01	0.00	92.26	1.47	337.09
	10	−3.28	−5.66	+0.01	0.00	104.43	−1.46	335.77
	11	2.04	4.64	0.01	0.00	116.60	1.44	335.85
	12	−0.73	3.32	0.01	0.00	128.78	1.42	337.42
	13	+0.54	1.78	0.01	0.00	140.96	1.41	340.48
	14	1.70	−0.14	0.02	0.00	153.14	1.39	344.87
	15	+2.73	+1.50	+0.02	0.00	165.33	−1.38	350.28
	16	3.60	3.02	0.02	0.00	177.53	1.36	356.26
	17	4.31	4.35	0.02	0.00	189.73	1.35	2.34
	18	4.86	5.41	0.02	0.00	201.94	1.34	8.12
	19	5.24	6.15	0.02	0.00	214.16	1.33	13.25
	20	+5.44	+6.55	+0.02	0.00	226.38	−1.32	17.53
	21	5.45	6.59	0.02	0.00	238.60	1.31	20.83
	22	5.24	6.29	0.02	0.00	250.82	1.30	23.09
	23	4.80	5.68	0.02	0.00	263.05	1.29	24.26
	24	4.12	4.80	0.02	0.00	275.28	1.28	24.32
	25	+3.20	+3.72	+0.02	0.00	287.50	−1.27	23.31
	26	2.07	2.48	0.02	0.00	299.73	1.26	21.26
	27	+0.78	+1.14	0.02	0.00	311.95	1.25	18.25
	28	−0.62	−0.23	0.02	0.00	324.16	1.24	14.40
	29	2.06	1.60	0.02	0.00	336.37	1.22	9.88
	30	−3.44	−2.90	+0.01	0.00	348.57	−1.21	4.89
Oct.	1	−4.69	−4.09	+0.01	0.00	0.77	−1.20	359.88

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		*c*
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
Oct. 1	−4.69	−4.09	+0.01	0.00	0.77	−1.20	359.66
2	5.71	5.12	0.01	0.00	12.96	1.18	354.42
3	6.41	5.93	0.01	0.00	25.14	1.16	349.41
4	6.72	6.47	0.01	0.00	37.32	1.14	344.85
5	6.60	6.69	0.01	0.00	49.49	1.12	340.97
6	−6.03	−6.54	+0.01	0.00	61.65	−1.10	337.99
7	5.04	6.00	0.01	0.00	73.81	1.07	336.13
8	3.69	5.06	0.01	0.00	85.97	1.05	335.61
9	2.11	3.77	0.01	0.00	98.13	1.02	336.62
10	−0.42	2.21	0.01	0.00	110.28	0.99	339.22
11	+1.25	−0.50	+0.02	0.00	122.44	−0.96	343.32
12	2.79	+1.24	0.02	0.00	134.60	0.93	348.62
13	4.12	2.86	0.02	0.00	146.77	0.90	354.66
14	5.18	4.28	0.02	0.00	158.94	0.87	0.90
15	5.95	5.42	0.02	0.00	171.12	0.84	6.86
16	+6.44	+6.21	+0.02	0.00	183.30	−0.82	12.18
17	6.64	6.66	0.02	0.00	195.49	0.80	16.66
18	6.58	6.74	0.02	0.00	207.68	0.77	20.17
19	6.26	6.48	0.02	0.00	219.89	0.75	22.66
20	5.71	5.91	0.02	0.00	232.09	0.74	24.09
21	+4.95	+5.07	+0.02	0.00	244.30	−0.72	24.44
22	3.99	4.00	0.02	0.00	256.51	0.70	23.73
23	2.87	2.77	0.02	0.00	268.72	0.68	21.96
24	1.60	1.42	0.02	0.00	280.93	0.66	19.21
25	+0.23	+0.03	0.02	0.00	293.14	0.64	15.58
26	−1.20	−1.37	+0.01	0.00	305.34	−0.62	11.22
27	2.64	2.70	0.01	0.00	317.54	0.60	6.35
28	4.01	3.93	0.01	0.00	329.74	0.58	1.20
29	5.25	5.00	0.01	0.00	341.93	0.56	356.00
30	6.29	5.86	0.01	0.00	354.12	0.54	350.98
31	−7.04	−6.48	+0.01	0.00	6.30	−0.51	346.35
Nov. 1	7.43	6.79	0.01	0.00	18.47	0.49	342.31
2	7.41	6.76	0.01	0.00	30.64	0.46	339.04
3	6.94	6.36	0.01	0.00	42.79	0.43	336.74
4	6.01	5.58	0.01	0.00	54.94	0.40	335.63
5	−4.67	−4.41	+0.01	0.00	67.09	−0.37	335.93
6	2.99	2.92	0.01	0.00	79.23	0.33	337.81
7	−1.10	−1.21	0.01	0.00	91.37	0.29	341.32
8	+0.87	+0.60	0.01	0.00	103.51	0.26	346.28
9	2.77	2.36	0.01	0.00	115.65	0.22	352.28
10	+4.46	+3.93	+0.02	0.00	127.79	−0.18	358.75
11	5.84	5.21	0.02	0.00	139.94	0.14	5.07
12	6.86	6.14	0.02	0.00	152.09	0.11	10.79
13	7.46	6.67	0.02	−0.01	164.25	0.08	15.63
14	7.68	6.83	0.02	0.01	176.42	0.05	19.45
15	+7.51	+6.63	+0.02	−0.01	188.59	−0.02	22.21
16	+7.02	+6.11	+0.02	−0.01	200.77	0.00	23.89

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Nov.	16	+7.02	+6.11	+0.02	−0.01	200.77	0.00	23.89
	17	6.24	5.31	0.02	0.01	212.95	+0.03	24.49
	18	5.24	4.28	0.01	0.01	225.14	0.05	24.03
	19	4.06	3.08	0.01	0.01	237.34	0.08	22.52
	20	2.76	1.75	0.01	0.01	249.53	0.10	20.02
	21	+1.38	+0.36	+0.01	−0.01	261.72	+0.12	16.61
	22	−0.04	−1.05	0.01	0.01	273.92	0.14	12.42
	23	1.46	2.41	0.01	0.01	286.12	0.16	7.64
	24	2.83	3.68	+0.01	0.01	298.31	0.19	2.52
	25	4.12	4.79	0.00	0.01	310.50	0.21	357.30
	26	−5.27	−5.70	0.00	−0.01	322.69	+0.23	352.24
	27	6.24	6.36	0.00	0.01	334.87	0.25	347.54
	28	6.98	6.75	0.00	0.01	347.05	0.27	343.38
	29	7.42	6.82	0.00	0.01	359.22	0.30	339.94
	30	7.53	6.54	0.00	0.01	11.38	0.32	337.38
Dec.	1	−7.25	−5.90	0.00	−0.01	23.53	+0.35	335.87
	2	6.56	4.91	0.00	0.01	35.68	0.38	335.59
	3	5.46	3.59	0.00	0.01	47.82	0.42	336.75
	4	3.97	1.99	0.00	0.01	59.96	0.45	339.46
	5	2.18	−0.23	+0.01	0.01	72.09	0.49	343.73
	6	−0.20	+1.56	+0.01	−0.01	84.22	+0.52	349.32
	7	+1.84	3 25	0.01	0.01	96.34	0.56	355.76
	8	3.76	4.70	0.01	0.01	108.47	0.59	2.39
	9	5.42	5.79	0.01	0.01	120.60	0.63	8.62
	10	6.71	6.49	0.01	0.01	132.74	0.66	14.02
	11	+7.54	+6.77	+0.01	−0.01	144.87	+0.69	18.35
	12	7.89	6.66	0.01	0.01	157.02	0.72	21.54
	13	7.79	6.21	0.01	0.01	169.17	0.74	23.57
	14	7.27	5.46	0.01	0.01	181.33	0.77	24.46
	15	6.41	4.48	0.01	0.01	193.50	0.79	24.26
	16	+5.30	+3.31	+0.01	−0.01	205.67	+0.82	23.01
	17	4.00	2.02	0.00	0.01	217.85	0.84	20.75
	18	2.60	+0.65	0.00	0.01	230.03	0.86	17.56
	19	+1.16	−0.74	0.00	0.01	242.21	0.88	13.56
	20	−0.26	2.10	0.00	0.01	254.40	0.89	8.90
	21	−1.62	−3.38	0.00	−0.01	266.58	+0.91	3.82
	22	2.86	4.51	0.00	0.01	278.77	0.93	358.57
	23	3.97	5.46	0.00	0.01	290.96	0.94	353.41
	24	4.93	6.16	0.00	0.01	303.15	0.96	348.57
	25	5.71	6.59	0.00	0.01	315.33	0.98	344.26
	26	−6.29	−6.71	−0.01	−0.01	327.51	+0.99	340.65
	27	6.65	6.50	0.01	0.01	339.68	1.01	337.90
	28	6.76	5.96	0.01	0.01	351.85	1.03	336.14
	29	6.59	5.09	0.01	0.01	4.01	1.04	335.51
	30	6.12	3.91	−0.01	0.01	16.16	1.07	336.17
	31	−5.31	−2.47	0.00	−0.01	28.31	+1.09	338.25
	32	−4.17	−0.84	0.00	−0.01	40.45	+1.11	341.79

ILLUMINATED DISK OF MERCURY, 1919.

FOR GREENWICH MEAN NOON.

Date.	k	i	θ	L	Stellar Mag.	Date.	k	i	θ	L	Stellar Mag.
		°	°					°	°		
Jan. 1	0.451	96	192	48.8	+0.2	July 5	0.648	73	11	37.3	+0.1
6	0.599	79	188	44.5	0.0	10	0.569	82	15	34.5	0.3
11	0.704	66	184	38.3	−0.1	15	0.491	91	18	32.7	0.6
16	0.779	56	180	33.2	0.1	20	0.412	100	21	31.3	0.8
21	0.834	48	175	29.6	0.2	25	0.327	110	24	29.4	1.0
26	0.876	41	170	27.4	−0.2	30	0.236	122	28	25.7	+1.3
31	0.910	35	165	26.4	0.3	Aug. 4	0.142	136	33	18.9	1.7
Feb. 5	0.937	29	159	26.5	0.4	9	0.058	152	44	9.3	2.2
10	0.961	23	153	27.8	0.6	14	0.012	167	87	2.2	2.9
15	0.981	16	144	30.4	0.8	19	0.034	159	168	6.1	2.4
20	0.995	8	123	34.9	−1.1	24	0.135	137	187	23.0	+1.4
25	0.997	6	30	41.7	1.3	29	0.307	113	194	45.3	+0.5
Mar. 2	0.978	17	349	51.3	1.3	Sept. 3	0.519	88	200	63.3	−0.2
7	0.916	34	340	62.5	1.2	8	0.724	63	205	69.4	0.8
12	0.791	54	335	70.7	1.0	13	0.874	42	210	63.5	1.1
17	0.605	78	332	68.7	−0.5	18	0.958	24	216	52.7	−1.2
22	0.395	102	330	54.6	+0.2	23	0.993	10	230	42.8	1.3
27	0.208	126	327	33.6	1.0	28	0.999	4	329	35.4	1.2
Apr. 1	0.074	148	321	13.3	1.9	Oct. 3	0.990	11	13	30.5	0.9
6	0.008	170	296	1.6	2.9	8	0.974	18	20	27.5	0.6
11	0.014	166	174	2.6	+2.8	13	0.953	25	22	26.0	−0.5
16	0.075	148	158	11.7	2.1	18	0.928	31	23	25.6	0.3
21	0.161	133	154	21.1	1.5	23	0.897	37	22	26.3	0.2
26	0.254	120	153	27.2	1.2	28	0.858	44	21	28.2	0.2
May 1	0.342	108	152	30.6	0.9	Nov. 2	0.807	52	19	31.5	0.1
6	0.426	98	152	32.7	+0.7	7	0.739	61	17	36.3	−0.1
11	0.508	89	152	34.6	0.5	12	0.643	73	14	42.5	−0.1
16	0.591	80	153	37.3	+0.2	17	0.507	89	12	48.2	+0.1
21	0.678	69	155	41.3	−0.1	22	0.322	111	11	46.2	0.5
26	0.773	57	158	47.3	0.5	27	0.116	140	9	24.4	1.4
31	0.871	42	162	55.2	−0.9	Dec. 2	0.002	175	325	0.5	+2.9
June 5	0.955	24	169	63.3	1.4	7	0.090	145	204	20.3	1.5
10	0.998	5	202	67.4	1.9	12	0.302	113	200	47.8	+0.5
15	0.980	16	343	64.4	1.6	17	0.505	89	197	52.7	0.0
20	0.911	35	354	56.5	1.1	22	0.656	72	194	46.5	−0.2
25	0.822	50	1	48.2	−0.6	27	0.759	59	190	39.1	−0.2
30	0.732	62	6	41.7	−0.2	32	0.830	49	186	33.3	−0.3

NOTATION.

k=the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i=the angle between the Sun and Earth, as seen from the planet.

θ=the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L=the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

ILLUMINATED DISK OF VENUS, 1919.

FOR GREENWICH MEAN NOON.

Date.	k	i	θ	L	Stellar Mag.	Date.	k	i	θ	L	Stellar Mag.
		°	°					°	°		
Jan. 1	0.988	12.6	358.2	48.2	−3.4	July 5	0.490	91.1	19.2	139.6	−4.0
6	0.985	14.3	355.7	48.5	3.4	10	0.462	94.4	20.5	147.8	4.0
11	0.981	15.9	353.3	48.9	3.4	15	0.431	97.9	21.7	156.4	4.0
16	0.977	17.5	351.0	49.3	3.4	20	0.399	101.6	22.8	165.0	4.1
21	0.972	19.2	348.9	49.8	3.4	25	0.365	105.7	23.9	173.3	4.1
26	0.967	20.8	346.9	50.3	−3.4	30	0.329	110.0	25.1	180.6	−4.2
31	0.962	22.5	345.1	50.9	3.3	Aug. 4	0.290	114.8	26.4	185.7	4.2
Feb. 5	0.956	24.2	343.5	51.5	3.3	9	0.249	120.1	27.9	186.6	4.2
10	0.950	25.9	342.1	52.2	3.3	14	0.206	126.0	29.8	181.3	4.2
15	0.943	27.6	341.0	53.0	3.3	19	0.162	132.6	32.3	166.9	4.1
20	0.936	29.4	340.1	53.9	−3.3	24	0.118	139.9	36.0	141.4	−4.0
25	0.928	31.2	339.4	54.8	3.4	29	0.076	148.0	41.7	105.3	3.8
Mar. 2	0.920	33.0	339.0	55.8	3.4	Sept. 3	0.042	156.5	51.8	64.4	3.6
7	0.911	34.8	338.8	56.9	3.4	8	0.019	164.3	72.8	31.0	3.3
12	0.901	36.7	338.8	58.1	3.4	13	0.011	167.9	117.1	19.2	3.2
17	0.891	38.6	339.1	59.3	−3.4	18	0.021	163.4	158.2	35.3	−3.4
22	0.880	40.5	339.6	60.7	3.4	23	0.046	155.2	176.8	72.5	3.7
27	0.869	42.5	340.3	62.2	3.4	28	0.082	146.6	185.9	116.8	3.9
Apr. 1	0.857	44.5	341.3	63.8	3.4	Oct. 3	0.125	138.6	191.1	155.7	4.1
6	0.844	46.5	342.6	65.5	3.4	8	0.171	131.2	194.6	183.2	4.2
11	0.831	48.6	344.1	67.3	−3.4	13	0.216	124.6	197.1	198.9	−4.3
16	0.817	50.7	345.8	69.3	3.4	18	0.259	118.8	199.0	204.9	4.3
21	0.802	52.8	347.7	71.5	3.5	23	0.300	113.5	200.6	204.2	4.3
26	0.787	55.0	349.7	73.8	3.5	28	0.339	108.8	201.8	199.2	4.3
May 1	0.771	57.2	352.0	76.3	3.5	Nov. 2	0.375	104.5	202.8	191.6	4.2
6	0.754	59.5	354.3	79.1	−3.5	7	0.408	100.5	203.6	182.8	−4.2
11	0.737	61.8	356.7	82.1	3.5	12	0.440	96.9	204.1	173.5	4.2
16	0.718	64.1	359.2	85.3	3.6	17	0.470	93.5	204.4	164.1	4.1
21	0.699	66.5	1.7	88.8	3.6	22	0.498	90.3	204.4	155.1	4.1
26	0.680	68.9	4.1	92.7	3.6	27	0.524	87.3	204.2	146.6	4.0
31	0.659	71.4	6.5	96.9	−3.7	Dec. 2	0.549	84.4	203.8	138.6	−4.0
June 5	0.638	74.0	8.7	101.5	3.7	7	0.573	81.7	203.1	131.2	3.9
10	0.616	76.6	10.8	106.6	3.7	12	0.595	79.0	202.1	124.3	3.9
15	0.593	79.3	12.8	112.2	3.8	17	0.617	76.5	200.9	117.9	3.8
20	0.569	82.1	14.6	118.2	3.8	22	0.637	74.1	199.5	112.0	3.8
25	0.544	85.0	16.3	124.7	−3.9	27	0.657	71.7	197.8	106.6	−3.8
30	0.518	88.0	17.8	131.9	−3.9	32	0.676	69.4	195.9	101.7	−3.7

NOTATION.

k=the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i=the angle between the Sun and Earth, as seen from the planet.

θ=the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L=the brilliancy of the disk. The unit of *L* is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN NOON.

Date.	Light-Time.	Stellar Magnitude.	P	$A_\oplus+180°$	$D_\oplus$	$A_\odot-A_\oplus$	$D_\odot$	$\odot_{♂}$
	m		°	°	°	°	°	°
Oct. 1	18.51	+1.9	6.07	234.31	+20.43	−24.18	+12.59	32.42
3	18.41	1.9	6.82	235.59	20.70	24.59	12.90	33.33
5	18.31	1.9	7.56	236.87	20.96	25.01	13.22	34.23
7	18.21	1.8	8.30	238.16	21.21	25.42	13.52	35.13
9	18.10	1.8	9.03	239.44	21.44	25.84	13.83	36.03
11	18.00	+1.8	9.76	240.73	+21.67	−26.25	+14.13	36.92
13	17.89	1.8	10.48	242.01	21.88	26.67	14.43	37.82
15	17.78	1.8	11.20	243.30	22.08	27.08	14.73	38.72
17	17.67	1.8	11.92	244.59	22.27	27.49	15.02	39.61
19	17.55	1.8	12.62	245.88	22.45	27.91	15.31	40.50
21	17.44	+1.8	13.33	247.16	+22.62	−28.32	+15.59	41.39
23	17.32	1.8	14.02	248.45	22.78	28.72	15.87	42.28
25	17.20	1.8	14.71	249.73	22.93	29.13	16.15	43.17
27	17.08	1.8	15.39	251.02	23.06	29.54	16.42	44.06
29	16.96	1.8	16.07	252.30	23.18	29.94	16.69	44.94
31	16.83	+1.8	16.73	253.58	+23.30	−30.34	+16.95	45.83
Nov. 2	16.71	1.7	17.39	254.86	23.40	30.73	17.21	46.71
4	16.58	1.7	18.04	256.13	23.48	31.12	17.46	47.60
6	16.45	1.7	18.68	257.41	23.56	31.50	17.72	48.48
8	16.32	1.7	19.32	258.68	23.63	31.88	17.96	49.36
10	16.18	+1.7	19.94	259.94	+23.68	−32.26	+18.21	50.24
12	16.04	1.7	20.56	261.20	23.73	32.63	18.45	51.12
14	15.91	1.7	21.16	262.46	23.76	32.99	18.68	52.00
16	15.77	1.7	21.76	263.72	23.78	33.35	18.91	52.88
18	15.63	1.6	22.34	264.97	23.79	33.70	19.14	53.76
20	15.49	+1.6	22.92	266.21	+23.79	−34.05	+19.36	54.64
22	15.34	1.6	23.48	267.45	23.78	34.38	19.57	55.51
24	15.20	1.6	24.03	268.68	23.76	34.71	19.78	56.39
26	15.05	1.6	24.57	269.90	23.73	35.03	19.99	57.26
28	14.90	1.6	25.10	271.12	23.69	35.34	20.19	58.14
30	14.75	+1.5	25.62	272.33	+23.64	−35.64	+20.39	59.01
Dec. 2	14.60	1.5	26.12	273.53	23.58	35.94	20.58	59.89
4	14.45	1.5	26.62	274.72	23.51	36.22	20.77	60.76
6	14.29	1.5	27.10	275.91	23.43	36.49	20.96	61.64
8	14.14	1.5	27.57	277.09	23.34	36.75	21.13	62.51
10	13.98	+1.4	28.02	278.25	+23.24	−37.00	+21.31	63.38
12	13.83	1.4	28.47	279.41	23.14	37.23	21.48	64.26
14	13.67	1.4	28.90	280.56	23.02	37.46	21.64	65.13
16	13.51	1.4	29.32	281.70	22.90	37.67	21.80	66.00
18	13.35	1.4	29.72	282.82	22.77	37.87	21.95	66.88
20	13.18	+1.3	30.11	283.94	+22.63	−38.06	+22.10	67.75
22	13.02	1.3	30.49	285.04	22.49	38.23	22.24	68.62
24	12.86	1.3	30.85	286.13	22.34	38.39	22.38	69.50
26	12.69	1.3	31.20	287.21	22.18	38.53	22.51	70.37
28	12.53	1.2	31.54	288.27	22.01	38.66	22.63	71.24
30	12.36	+1.2	31.87	289.32	+21.84	−38.78	+22.76	72.12
32	12.20	+1.2	32.18	290.36	+21.67	−38.87	+22.87	72.99

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN NOON.

Date.		*k*	Diameter.	*i*	*q*	*Q*	Central Meridian.	Mean Time of Transit of Zero Meridian.	
								Of Date.	Of Intermediate Date.
			″	°	″	°	°	h m	h m
Oct.	1	0.955	4.54	24.44	0.20	291.00	105.72	17 25.4	18 5.4
	3	0.954	4.56	24.77	0.21	291.25	86.24	18 45.5	19 25.5
	5	0.953	4.58	25.09	0.22	291.49	66.77	20 5.5	20 45.6
	7	0.952	4.61	25.41	0.22	291.72	47.30	21 25.6	22 5.6
	9	0.950	4.64	25.73	0.23	291.94	27.82	22 45.7	23 25.7
	11	0.949	4.66	26.05	0.24	292.14	8.34	. . . . .	0 5.7
	13	0.948	4.69	26.37	0.24	292.34	348.87	0 45.8	1 25.8
	15	0.947	4.72	26.68	0.25	292.53	329.39	2 5.8	2 45.9
	17	0.946	4.75	27.00	0.26	292.70	309.91	3 25.9	4 5.9
	19	0.944	4.78	27.31	0.27	292.87	290.44	4 46.0	5 26.0
	21	0.943	4.81	27.61	0.27	293.03	270.96	6 6.0	6 46.1
	23	0.942	4.84	27.92	0.28	293.18	251.49	7 26.1	8 6.1
	25	0.941	4.88	28.23	0.29	293.32	232.02	8 46.2	9 26.2
	27	0.939	4.91	28.53	0.30	293.44	212.55	10 6.2	10 46.2
	29	0.938	4.95	28.83	0.31	293.56	193.08	11 26.2	12 6.2
	31	0.937	4.99	29.12	0.32	293.67	173.61	12 46.3	13 26.3
Nov.	2	0.935	5.02	29.42	0.32	293.76	154.15	14 6.3	14 46.3
	4	0.934	5.06	29.71	0.33	293.85	134.69	15 26.3	16 6.3
	6	0.933	5.10	29.99	0.34	293.93	115.23	16 46.2	17 26.2
	8	0.932	5.14	30.28	0.35	294.00	95.78	18 6.2	18 46.2
	10	0.931	5.19	30.55	0.36	294.07	76.33	19 26.2	20 6.1
	12	0.929	5.23	30.83	0.37	294.12	56.89	20 46.1	21 26.1
	14	0.928	5.28	31.10	0.38	294.16	37.44	22 6.0	22 46.0
	16	0.927	5.32	31.37	0.39	294.19	18.01	23 25.9	. . . . .
	18	0.926	5.37	31.64	0.40	294.21	358.58	0 5.8	0 45.8
	20	0.924	5.42	31.90	0.41	294.23	339.15	1 25.7	2 5.6
	22	0.923	5.47	32.15	0.42	294.24	319.73	2 45.5	3 25.4
	24	0.922	5.52	32.40	0.43	294.24	300.32	4 5.3	4 45.2
	26	0.921	5.58	32.65	0.44	294.23	280.92	5 25.1	6 5.0
	28	0.920	5.63	32.89	0.45	294.21	261.52	6 44.8	7 24.7
	30	0.919	5.69	33.12	0.46	294.18	242.13	8 4.5	8 44.3
Dec.	2	0.918	5.75	33.35	0.47	294.14	222.75	9 24.2	10 4.0
	4	0.917	5.81	33.57	0.48	294.10	203.38	10 43.8	11 23.6
	6	0.916	5.87	33.79	0.50	294.05	184.02	12 3.4	12 43.2
	8	0.914	5.94	34.00	0.51	293.99	164.66	13 22.9	14 2.7
	10	0.913	6.00	34.20	0.52	293.92	145.32	14 42.4	15 22.2
	12	0.912	6.07	34.40	0.53	293.85	125.98	16 1.9	16 41.6
	14	0.912	6.14	34.58	0.54	293.76	106.66	17 21.3	18 1.0
	16	0.911	6.21	34.77	0.55	293.67	87.34	18 40.7	19 20.4
	18	0.910	6.29	34.94	0.57	293.58	68.04	20 0.0	20 39.6
	20	0.909	6.37	35.10	0.58	293.47	48.75	21 19.3	21 58.9
	22	0.908	6.44	35.26	0.59	293.36	29.47	22 38.5	23 18.1
	24	0.908	6.53	35.41	0.60	293.25	10.20	23 57.6	. . . . .
	26	0.907	6.61	35.54	0.62	293.12	350.95	0 37.2	1 16.8
	28	0.906	6.70	35.67	0.63	292.99	331.71	1 56.3	2 35.8
	30	0.906	6.79	35.78	0.64	292.86	312.48	3 15.3	3 54.8
	32	0.905	6.88	35.89	0.65	292.72	293.27	4 34.2	. . . . .

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

FOR GREENWICH MEAN NOON.

Date.		Light-Time.	Stellar Magnitude.	P	$A_{\oplus}+180°$	$D_{\oplus}$	$A_{\odot}+180°$	$D_{\odot}$
		m		°	°	°	°	°
Jan.	1	34.87	−2.3	5.89	325.18	+1.75	325.01	+1.76
	8	34.94	2.2	5.46	324.23	1.75	325.60	1.74
	15	35.14	2.2	5.04	323.32	1.76	326.18	1.71
	22	35.47	2.2	4.66	322.47	1.76	326.77	1.68
	29	35.91	2.2	4.31	321.72	1.76	327.35	1.66
Feb.	5	36.46	−2.1	4.02	321.09	+1.75	327.93	+1.63
	12	37.10	2.1	3.80	320.60	1.75	328.52	1.60
	19	37.83	2.1	3.64	320.27	1.74	329.10	1.58
	26	38.62	2.0	3.56	320.09	1.74	329.68	1.55
Mar.	5	39.47	2.0	3.55	320.07	1.72	330.26	1.52
	12	40.37	−1.9	3.62	320.22	+1.71	330.84	+1.50
	19	41.28	1.9	3.76	320.52	1.69	331.42	1.47
	26	42.22	1.8	3.96	320.97	1.68	332.00	1.44
Apr.	2	43.16	1.8	4.24	321.55	1.66	332.58	1.41
	9	44.09	1.7	4.57	322.27	1.63	333.16	1.39
	16	45.00	−1.7	4.96	323.11	+1.61	333.73	+1.36
	23	45.88	1.6	5.39	324.06	1.58	334.31	1.33
	30	46.73	1.6	5.87	325.10	1.55	334.89	1.30
May	7	47.54	1.6	6.38	326.24	1.52	335.46	1.28
	14	48.29	1.5	6.93	327.45	1.48	336.04	1.25
	21	48.99	−1.5	7.50	328.74	+1.45	336.61	+1.22
	28	49.63	1.5	8.10	330.08	1.41	337.19	1.19
June	4	50.20	1.4	8.72	331.48	1.37	337.76	1.16
	11	50.70	1.4	9.34	332.92	1.32	338.33	1.13
	18	51.13	1.4	9.98	334.40	1.28	338.90	1.11
	25	51.48	−1.4	10.62	335.90	+1.23	339.48	+1.08
		....	..	....	.....	...	.....	...
		....	..	....	.....	...	.....	...
Aug.	28	50.94	−1.4	16.06	349.93	+0.71	344.68	+0.81
Sept.	4	50.48	1.4	16.56	351.36	0.65	345.25	0.78
	11	49.95	−1.4	17.04	352.74	+0.59	345.81	+0.75
	18	49.35	1.4	17.48	354.08	0.53	346.38	0.72
	25	48.68	1.5	17.89	355.35	0.47	346.94	0.69
Oct.	2	47.96	1.5	18.27	356.54	0.41	347.51	0.66
	9	47.18	1.6	18.61	357.66	0.35	348.07	0.64
	16	46.36	−1.6	18.92	358.68	+0.30	348.63	+0.61
	23	45.51	1.6	19.20	359.60	0.24	349.20	0.58
	30	44.62	1.7	19.43	0.41	0.19	349.76	0.55
Nov.	6	43.72	1.7	19.63	1.09	0.15	350.32	0.52
	13	42.81	1.8	19.79	1.64	0.10	350.88	0.49
	20	41.90	−1.8	19.90	2.05	+0.06	351.44	+0.46
	27	41.01	1.8	19.98	2.31	+0.03	352.00	0.43
Dec.	4	40.16	1.9	20.01	2.40	0.00	352.56	0.40
	11	39.34	1.9	19.99	2.34	−0.03	353.12	0.37
	18	38.59	2.0	19.93	2.12	0.05	353.68	0.34
	25	37.91	−2.0	19.83	1.74	−0.06	354.24	+0.31
	32	37.31	−2.0	19.69	1.22	−0.07	354.80	+0.28

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

FOR GREENWICH MEAN NOON.

Date.		Equatorial Diameter.	Excess of Equat. Diameter over Polar.	*i*	*q*	*Q*	Central Meridian.		Correction for Phase.
							System I.	System II.	
		″	″	°	″	°	°	°	°
Jan.	1	47.76	2.89	0.16	0.00	272.42	10.54	0.52	0.00
	8	47.66	2.89	1.36	0.01	94.70	36.74	333.32	−0.01
	15	47.38	2.87	2.86	0.03	94.12	62.83	306.00	0.04
	22	46.94	2.84	4.29	0.07	93.72	88.77	278.53	0.08
	29	46.37	2.81	5.62	0.11	93.38	114.55	250.91	0.14
Feb.	5	45.68	2.77	6.84	0.16	93.08	140.15	223.10	−0.20
	12	44.88	2.72	7.91	0.21	92.84	165.55	195.09	0.27
	19	44.02	2.67	8.83	0.26	92.69	190.74	166.88	0.34
	26	43.12	2.61	9.59	0.30	92.59	215.74	138.46	0.40
Mar.	5	42.18	2.56	10.19	0.33	92.57	240.54	109.86	0.45
	12	41.25	2.50	10.62	0.35	92.62	265.15	81.06	−0.49
	19	40.33	2.44	10.90	0.36	92.73	289.58	52.10	0.52
	26	39.44	2.39	11.03	0.37	92.90	313.86	22.97	0.53
Apr.	2	38.58	2.34	11.02	0.36	93.13	338.01	353.71	0.53
	9	37.77	2.29	10.88	0.34	93.41	2.02	324.32	0.52
	16	37.01	2.24	10.62	0.32	93.74	25.93	294.82	−0.49
	23	36.29	2.20	10.25	0.29	94.13	49.74	265.23	0.46
	30	35.63	2.16	9.78	0.26	94.54	73.48	235.56	0.42
May	7	35.03	2.12	9.22	0.23	94.98	97.15	205.83	0.37
	14	34.48	2.09	8.58	0.20	95.45	120.78	176.05	0.32
	21	33.99	2.06	7.88	0.16	95.94	144.37	146.23	−0.27
	28	33.55	2.03	7.11	0.13	96.43	167.94	116.39	0.22
June	4	33.17	2.01	6.28	0.10	96.93	191.49	86.54	0.17
	11	32.84	1.99	5.42	0.07	97.41	215.04	56.69	0.13
	18	32.57	1.97	4.51	0.05	97.86	238.61	26.84	0.09
	25	32.35	1.96	3.58	0.03	98.22	262.19	357.01	−0.06
		....	...	....	...	.....	.....	.....	...
		....	...	....	...	.....	.....	.....	...
Aug.	28	32.69	1.98	5.25	0.07	284.94	274.09	240.59	+0.12
Sept.	4	32.99	2.00	6.12	0.09	285.30	298.24	211.33	0.16
	11	33.34	2.02	6.93	0.12	285.66	322.48	182.15	+0.21
	18	33.75	2.05	7.70	0.15	286.00	346.81	153.08	0.26
	25	34.21	2.08	8.41	0.18	286.32	11.25	124.10	0.31
Oct.	2	34.72	2.11	9.04	0.22	286.62	35.79	95.23	0.36
	9	35.29	2.14	9.59	0.25	286.89	60.45	66.47	0.40
	16	35.92	2.18	10.05	0.28	287.13	85.23	37.83	+0.44
	23	36.59	2.22	10.41	0.30	287.34	110.13	9.32	0.47
	30	37.32	2.26	10.66	0.32	287.51	135.16	340.94	0.49
Nov.	6	38.09	2.31	10.78	0.34	287.64	160.33	312.69	0.50
	13	38.90	2.36	10.77	0.34	287.72	185.63	284.58	0.50
	20	39.74	2.41	10.61	0.34	287.76	211.08	256.61	+0.49
	27	40.60	2.46	10.31	0.33	287.74	236.66	228.78	0.46
Dec.	4	41.47	2.52	9.85	0.31	287.66	262.39	201.09	0.42
	11	42.32	2.57	9.23	0.28	287.52	288.24	173.53	0.37
	18	43.15	2.62	8.45	0.24	287.31	314.22	146.10	0.31
	25	43.93	2.66	7.52	0.19	287.02	340.32	118.78	+0.[illegible]
	32	44.63	2.71	6.43	0.14	286.61	6.50	91.56	[illegible]

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER, SYSTEM I.

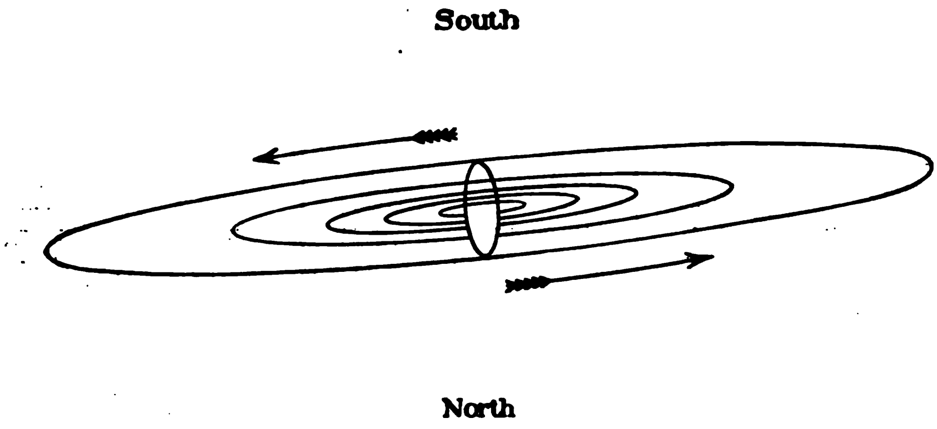
GREENWICH MEAN TIME.

Transit of Zero Meridian.				Interval between Successive Transits.		Transit of Zero Meridian.				Interval between Successive Transits.		Transit of Zero Meridian.				Interval between Successive Transits.	
	d	h	m	h	m		d	h	m	h	m		d	h	m	h	m
Jan.	1	9	33.13	9	50.41	Apr.	18	0	31.45	9	50.64	Sept.	19	15	43.54	9	50.58
	3	10	45.18				20	1	44.65				21	16	56.44		
	5	11	57.25				22	2	57.86				23	18	9.32		
	7	13	9.34				24	4	11.07				25	19	22.19		
	9	14	21.45				26	5	24.30				27	20	35.04		
	11	15	33.57	9	50.43		28	6	37.53	9	50.65		29	21	47.88	9	50.56
	13	16	45.72				30	7	50.78			Oct.	1	23	0.70		
	15	17	57.89			May	2	9	4.03				4	0	13.51		
	17	19	10.08				4	10	17.29				6	1	26.30		
	19	20	22.29				6	11	30.56				8	2	39.08		
	21	21	34.53	9	50.46		8	12	43.83	9	50.66		10	3	51.84	9	50.55
	23	22	46.79				10	13	57.11				12	5	4.58		
	25	23	59.08				12	15	10.39				14	6	17.31		
	28	1	11.40				14	16	23.68				16	7	30.02		
	30	2	23.74				16	17	36.97				18	8	42.71		
Feb.	1	3	36.11	9	50.48		18	18	50.27	9	50.66		20	9	55.39	9	50.53
	3	4	48.51				20	20	3.58				22	11	8.05		
	5	6	0.94				22	21	16.88				24	12	20.69		
	7	7	13.39				24	22	30.19				26	13	33.32		
	9	8	25.88				26	23	43.50				28	14	45.93		
	11	9	38.39	9	50.51		29	0	56.81	9	50.66		30	15	58.52	9	50.51
	13	10	50.93				31	2	10.13			Nov.	1	17	11.09		
	15	12	3.50			June	2	3	23.44				3	18	23.65		
	17	13	16.10				4	4	36.76				5	19	36.18		
	19	14	28.73				6	5	50.08				7	20	48.71		
	21	15	41.38	9	50.54		8	7	3.40	9	50.66		9	22	1.21	9	50.50
	23	16	54.05				10	8	16.72				11	23	13.70		
	25	18	6.76				12	9	30.03				14	0	26.17		
	27	19	19.49				14	10	43.35				16	1	38.62		
Mar.	1	20	32.25				16	11	56.67				18	2	51.05		
	3	21	45.03	9	50.56		18	13	9.98	9	50.66		20	4	3.47	9	50.48
	5	22	57.84				20	14	23.30				22	5	15.86		
	8	0	10.67				22	15	36.61				24	6	28.24		
	10	1	23.53				24	16	49.91				26	7	40.60		
	12	2	36.41				26	18	3.22				28	8	52.94		
	14	3	49.31	9	50.59		28	19	16.53	9	50.66		30	10	5.27	9	50.46
	16	5	2.23				30	20	29.83			Dec.	2	11	17.58		
	18	6	15.18			July	2	21	43.12				4	12	29.87		
	20	7	28.15				4	22	56.42				6	13	42.14		
	22	8	41.13				...	...	...				8	14	54.40		
	24	9	54.14	9	50.61		...	...	...				10	16	6.64	9	50.44
	26	11	7.16			Aug.	28	2	20.75	9	50.61		12	17	18.86		
	28	12	20.20				30	3	33.80				14	18	31.07		
	30	13	33.26			Sept.	1	4	46.83				16	19	43.26		
Apr.	1	14	46.33				3	5	59.85				18	20	55.44		
	3	15	59.42	9	50.62		5	7	12.86	9	50.60		20	22	7.60	9	50.43
	5	17	12.53				7	8	25.86				22	23	19.74		
	7	18	25.65				9	9	38.84				25	0	31.88		
	9	19	38.78				11	10	51.81				27	1	44.00		
	11	20	51.93				13	12	4.76				29	2	56.11		
	13	22	5.10	9	50.64		15	13	17.70	9	50.58		31	4	8.20	9	50.42
	15	23	18.27				17	14	30.63				33	5	20.29		

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER, SYSTEM II.

GREENWICH MEAN TIME.

Transit of Zero Meridian.				Interval between Successive Transits.		Transit of Zero Meridian.				Interval between Successive Transits.		Transit of Zero Meridian.				Interval between Successive Transits.	
	d	h	m	h	m		d	h	m	h	m		d	h	m	h	m
Jan.	1	9	54.72	9	55.59	Apr.	18	23	19.41	9	55.82	Sept.	19	21	25.06	9	55.76
	3	11	32.65				21	0	58.50				21	23	3.84		
	5	13	10.60				23	2	37.61				24	0	42.62		
	7	14	48.57				25	4	16.73				26	2	21.38		
	9	16	26.55				27	5	55.86				28	4	0.12		
	11	18	4.56	9	55.61		29	7	35.00	9	55.83		30	5	38.85	9	55.74
	13	19	42.58			May	1	9	14.14			Oct.	2	7	17.56		
	15	21	20.63				3	10	53.29				4	8	56.26		
	17	22	58.70				5	12	32.45				6	10	34.94		
	20	0	36.80				7	14	11.62				8	12	13.61		
	22	2	14.92	9	55.64		9	15	50.79	9	55.84		10	13	52.26	9	55.72
	24	3	53.07				11	17	29.97				12	15	30.89		
	26	5	31.24				13	19	9.16				14	17	9.51		
	28	7	9.44				15	20	48.35				16	18	48.10		
	30	8	47.67				17	22	27.54				18	20	26.69		
Feb.	1	10	25.93	9	55.66		20	0	6.74	9	55.84		20	22	5.25	9	55.71
	3	12	4.21				22	1	45.94				22	23	43.80		
	5	13	42.52				24	3	25.15				25	1	22.32		
	7	15	20.87				26	5	4.36				27	3	0.84		
	9	16	59.24				28	6	43.57				29	4	39.33		
	11	18	37.64	9	55.69		30	8	22.78	9	55.84		31	6	17.80	9	55.69
	13	20	16.08			June	1	10	1.99			Nov.	2	7	56.26		
	15	21	54.54				3	11	41.21				4	9	34.70		
	17	23	33.02				5	13	20.42				6	11	13.12		
	20	1	11.54				7	14	59.64				8	12	51.53		
	22	2	50.08	9	55.72		9	16	38.86	9	55.84		10	14	29.91	9	55.67
	24	4	28.65				11	18	18.07				12	16	8.28		
	26	6	7.25				13	19	57.29				14	17	46.63		
	28	7	45.88				15	21	36.51				16	19	24.96		
Mar.	2	9	24.53				17	23	15.72				18	21	3.28		
	4	11	3.21	9	55.75		20	0	54.93	9	55.84		20	22	41.57	9	55.65
	6	12	41.91				22	2	34.15				23	0	19.85		
	8	14	20.64				24	4	13.36				25	1	58.10		
	10	15	59.40				26	5	52.56				27	3	36.34		
	12	17	38.17				28	7	31.77				29	5	14.56		
	14	19	16.97	9	55.77		30	9	10.97	9	55.84	Dec.	1	6	52.77	9	55.63
	16	20	55.80			July	2	10	50.17				3	8	30.95		
	18	22	34.64				4	12	29.36				5	10	9.12		
	21	0	13.50				6	14	8.56				7	11	47.27		
	23	1	52.39				. .	. .	. . . .				9	13	25.40		
	25	3	31.29	9	55.79		. .	. .	. . . .				11	15	3.52	9	55.62
	27	5	10.21			Aug.	28	3	17.42	9	55.79		13	16	41.62		
	29	6	49.15				30	4	56.36				15	18	19.70		
	31	8	28.11			Sept.	1	6	35.30				17	19	57.77		
Apr.	2	10	7.08				3	8	14.21				19	21	35.82		
	4	11	46.07	9	55.81		5	9	53.12	9	55.77		21	23	13.85	9	55.60
	6	13	25.08				7	11	32.01				24	0	51.87		
	8	15	4.10				9	13	10.88				26	2	29.88		
	10	16	43.14				11	14	49.75				28	4	7.87		
	12	18	22.19				13	16	28.60				30	5	45.85		
	14	20	1.25	9	55.82		15	18	7.43	9	55.76		32	7	23.82	9	55.59
	16	21	40.32				17	19	46.25				34	9	1.78		



APPARENT ORBITS OF THE SATELLITES OF JUPITER AT DATE OF OPPOSITION, JANUARY 1, 1919, AS SEEN IN AN INVERTING TELESCOPE, AND ELONGATED IN THE RATIO OF THREE TO ONE IN THE DIRECTION OF THEIR MINOR AXES.

In the above diagram the central ellipse represents the disk of Jupiter, and the inner orbit is that of Satellite V.

In the diagrams of the configurations of Jupiter's four brighter satellites, pages 631-651, Jupiter is represented by a light disk, ○, in the center of the page, and the relative positions of the satellites at the Greenwich time stated above the diagrams are indicated by dots. The designation of each satellite is shown by a numeral placed to the right or left of the dot, according as the motion of the satellite at the instant in question is toward the east or toward the west, the motion being always toward the numeral. In constructing the diagrams the latitudes of the satellites are always considered zero, except where two or more of them chance to be at nearly the same distance from the planet, when they are placed one above the other, according to their apparent latitudes. If, at the epoch of any configuration, one or more satellites are projected on the disk of the planet, that phenomenon is indicated by a light disk, ○, at the left-hand side of the page; and if any satellites are invisible on account of being occulted behind the disk of the planet, or eclipsed by its shadow, that circumstance is indicated by a dark disk, ●, at the right-hand side of the page. In both cases the annexed numerals serve to point out which satellites are thus rendered invisible.

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s	d		d	h	m	s	d
I.	1	18	28	35.946	- 1.769 860 49	V.	0	11	57	27.635	- 0.498 236 52
II.	3	13	17	53.736	- 3.554 094 17	VI.					-266.00
III.	7	3	59	35.856	- 7.166 387 22	VII.					-276.67
IV.	16	18	5	6.916	-16.753 552 27						

SATELLITE V.

GREENWICH MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATION.

	d	h			d	h			d	h			d	h	
Jan.	1	20.6	E.	Apr.	1	12.7	E.	Jan.	1	14.6	W.	Apr.	1	6.7	W.
	11	19.7	E.		. .	. . .			11	13.7	W.		. .	. . .	
	21	18.7	E.	Nov.	1	19.2	E.		21	12.8	W.	Nov.	1	13.3	W.
	31	17.8	E.		11	18.4	E.		31	11.9	W.		11	12.4	W.
Feb.	10	17.0	E.		21	17.5	E.	Feb.	10	11.0	W.		21	11.5	W.
	20	16.1	E.	Dec.	1	16.6	E.		20	10.1	W.	Dec.	1	10.6	W.
Mar.	2	15.2	E.		11	15.7	E.	Mar.	2	9.2	W.		11	9.7	W.
	12	14.4	E.		21	14.8	E.		12	8.4	W.		21	8.8	W.
	22	13.5	E.		31	13.9	E.		22	7.6	W.		31	7.9	W.

GREENWICH MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	1	3	27.2	Mar.	23	12	13.9	June	12	23	1.9	Oct.	13	3	31.4
	2	21	53.2		25	6	42.7		14	17	32.2		14	22	0.5
	4	16	19.1		27	1	11.5		16	12	2.5		16	16	29.5
	6	10	45.0		28	19	40.4		18	6	32.9		18	10	58.5
	8	5	10.9		30	14	9.3		20	1	3.2		20	5	27.4
	9	23	37.0	Apr.	1	8	38.4		21	19	33.5		21	23	56.2
	11	18	3.0		3	3	7.3		23	14	3.9		23	18	25.0
	13	12	29.0		4	21	36.5		25	8	34.2		25	12	53.8
	15	6	55.1		6	16	5.6		. .	. . .	. .		27	7	22.5
	17	1	21.2		8	10	34.9		. .	. . .	. .		29	1	51.1
	18	19	47.4		10	5	4.1		. .	. . .	. .		30	20	19.7
	20	14	13.6		11	23	33.5		. .	. . .	. .	Nov.	1	14	48.3
	22	8	39.8		13	18	2.8	Aug.	13	22	42.2		3	9	16.8
	24	3	6.2		15	12	32.3		15	17	12.3		5	3	45.2
	25	21	32.5		17	7	1.7		17	11	42.4		6	22	13.6
	27	15	59.0		19	1	31.3		19	6	12.5		8	16	41.9
	29	10	25.4		20	20	0.8		21	0	42.5		10	11	10.1
	31	4	52.0		22	14	30.5		22	19	12.6		12	5	38.3
Feb.	1	23	18.6		24	9	0.1		24	13	42.6		14	0	6.4
	3	17	45.3		26	3	29.8		26	8	12.6		15	18	34.5
	5	12	12.0		27	21	59.5		28	2	42.6		17	13	2.5
	7	6	38.9		29	16	29.3		29	21	12.5		19	7	30.5
	9	1	5.7	May	1	10	59.0		31	15	42.5		21	1	58.3
	10	19	32.7		3	5	28.9	Sept.	2	10	12.3		22	20	26.1
	12	13	59.7		4	23	58.7		4	4	42.2		24	14	53.9
	14	8	26.9		6	18	28.7		5	23	12.1		26	9	21.5
	16	2	54.1		8	12	58.6		7	17	41.9		28	3	49.1
	17	21	21.4		10	7	28.6		9	12	11.7		29	22	16.7
	19	15	48.7		12	1	58.5		11	6	41.5	Dec.	1	16	44.1
	21	10	16.1		13	20	28.6		13	1	11.2		3	11	11.6
	23	4	43.6		15	14	58.6		14	19	40.9		5	5	38.9
	24	23	11.2		17	9	28.7		16	14	10.6		7	0	6.2
	26	17	38.8		19	3	58.8		18	8	40.2		8	18	33.3
	28	12	6.6		20	22	28.9		20	3	9.9		10	13	0.5
Mar.	2	6	34.4		22	16	59.0		21	21	39.4		12	7	27.5
	4	1	2.3		24	11	29.2		23	16	8.9		14	1	54.5
	5	19	30.2		26	5	59.3		25	10	38.5		15	20	21.4
	7	13	58.3		28	0	29.6		27	5	8.0		17	14	48.3
	9	8	26.4		29	18	59.7		28	23	37.4		19	9	15.1
	11	2	54.7		31	13	30.0		30	18	6.8		21	3	41.9
	12	21	22.8	June	2	8	0.2	Oct.	2	12	36.1		22	22	8.5
	14	15	51.2		4	2	30.5		4	7	5.5		24	16	35.2
	16	10	19.6		5	21	0.7		6	1	34.7		26	11	1.7
	18	4	48.2		7	15	31.0		7	20	4.0		28	5	28.2
	19	23	16.6		9	10	1.3		9	14	33.1		29	23	54.6
	21	17	45.3		11	4	31.6		11	9	2.3		31	18	21.1

GREENWICH MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	0	1	13.0	Mar.	22	16	16.6	June	12	11	26.8	Oct.	15	0	43.
	3	14	19.4		26	5	33.5		16	0	51.2		18	14	4.
	7	3	26.0		29	18	51.0		19	14	16.0		22	3	24.
	10	16	32.6	Apr.	2	8	9.0		23	3	40.7		25	16	45.
	14	5	39.4		5	21	27.5		26	17	5.9		29	6	4.
	17	18	46.5		9	10	46.4			. .	. . .	Nov.	1	19	23.
	21	7	53.9		13	0	5.8	Aug.	15	13	1.1		5	8	42.
	24	21	1.6		16	13	25.6		19	2	25.9		8	22	0.
	28	10	9.8		20	2	45.8		22	15	51.4		12	11	17.
	31	23	18.3		23	16	6.4		26	5	16.0		16	0	35.
Feb.	4	12	27.3		27	5	27.4		29	18	41.3		19	13	51.
	8	1	36.9		30	18	48.7	Sept.	2	8	5.5		23	3	7.
	11	14	47.1	May	4	8	10.4		5	21	30.5		26	16	22.
	15	3	57.7		7	21	32.4		9	10	54.4		30	5	37.
	18	17	9.0		11	10	54.7		13	0	19.0	Dec.	3	18	51.
	22	6	20.8		15	0	17.3		16	13	42.4		7	8	4.
	25	19	33.3		18	13	40.1		20	3	6.5		10	21	17.
Mar.	1	8	46.2		22	3	3.3		23	16	29.4		14	10	29.
	4	21	59.8		25	16	26.6		27	5	53.0		17	23	41.
	8	11	14.0		29	5	50.3		30	19	15.3		21	12	52.
	12	0	28.8	June	1	19	14.0	Oct.	4	8	38.3		25	2	2.
	15	13	44.2		5	8	38.1		7	22	0.0		28	15	13.
	19	3	0.1		8	22	2.2		11	11	22.1		32	4	22.

SATELLITE III.

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	6	17	41.0	Apr.	2	13	2.5		. .	. . .	. . .	Oct.	13	10	44.
	13	20	56.6		9	17	7.7		. .	. . .	. . .		20	14	54.
	21	0	14.2		16	21	16.2		. .	. . .	. . .		27	19	0.
	28	3	35.1		24	1	27.5		. .	. .	. .	Nov.	3	23	2.
Feb.	4	6	59.8	May	1	5	41.8	Aug.	17	0	3.0		11	3	1.
	11	10	29.2		8	9	59.2		24	4	29.0		18	6	55.
	18	14	2.5		15	14	19.0		31	8	54.4		25	10	45.
	25	17	40.5		22	18	41.2	Sept.	7	13	17.6	Dec.	2	14	31.
Mar.	4	21	23.1		29	23	4.4		14	17	38.9		9	18	12.
	12	1	10.5	June	6	3	28.8		21	21	58.2		16	21	48.
	19	5	3.3		13	7	54.1		29	2	15.6		24	1	19.
	26	9	0.5		20	12	20.3	Oct.	6	6	31.3		31	4	46.

SATELLITE IV.

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	14	1	17.5	Apr.	7	10	36.6		. .	. . .	. . .	Oct.	26	11	52.
	30	15	43.5		24	5	35.7	Aug.	20	4	35.3	Nov.	12	6	8.
Feb.	16	6	56.8	May	11	1	12.5	Sept.	6	1	2.3		28	23	29.
Mar.	4	23	10.4		27	21	17.9		22	21	10.4	Dec.	15	15	50.
	21	16	25.5	June	13	17	44.2	Oct.	9	16	49.6		32	7	12.

DIFFERENTIAL COORDINATES OF SATELLITE VI.

FOR GREENWICH MEAN NOON.

Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$
	m s	′		m s	′		m s	′
Jan. 1	−1 34	−32.7	Apr. 11	+3 18	+11.4	Sept. 27	−1 49	−15.4
5	1 9	32.6	15	3 7	12.9	Oct. 1	1 39	15.1
9	0 44	32.3	19	2 55	14.2	5	1 28	14.7
13	−0 20	31.7	23	2 41	15.2	9	1 16	14.2
17	+0 5	30.8	27	2 26	16.1	13	1 3	13.7
21	+0 30	−29.7	May 1	+2 9	+16.7	17	−0 50	−13.1
25	0 53	28.3	5	1 51	17.1	21	0 36	12.5
29	1 16	26.7	9	1 32	17.2	25	0 21	11.8
Feb. 2	1 38	24.9	13	1 12	17.0	29	−0 6	11.0
6	1 58	23.0	17	0 51	16.6	Nov. 2	+0 10	10.2
10	+2 16	−20.9	21	+0 30	+16.0	6	+0 26	− 9.3
14	2 33	18.7	25	+0 9	15.1	10	0 42	8.4
18	2 49	16.5	29	−0 12	14.0	14	0 59	7.4
22	3 2	14.1	June 2	0 32	12.7	18	1 16	6.4
26	3 14	11.8	6	0 51	11.3	22	1 33	5.3
Mar. 2	+3 24	− 9.4	10	−1 10	+ 9.6	26	+1 50	− 4.2
6	3 32	7.0	14	−1 27	+ 8.0	30	2 7	3.0
10	3 37	4.7		. . .	. . .	Dec. 4	2 23	1.8
14	3 41	2.4	Aug. 30	−2 44	−15.1	8	2 38	− 0.5
18	3 44	− 0.2	Sept. 3	2 39	15.4	12	2 52	+ 0.9
22	+3 44	+ 2.0	7	−2 32	−15.6	16	+3 5	+ 2.3
26	3 42	4.1	11	2 25	15.8	20	3 17	3.7
30	3 39	6.1	15	2 17	15.8	24	3 26	5.1
Apr. 3	3 34	8.0	19	2 9	15.7	28	3 32	6.5
7	+3 26	+ 9.8	23	−1 59	−15.6	32	+3 36	+ 7.9

DIFFERENTIAL COORDINATES OF SATELLITE VII.

Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$
	m s	′		m s	′		m s	′
Jan. 1	+2 5	+17.2	Apr. 11	−3 51	+22.8	Sept. 27	+2 39	+ 8.3
5	1 44	19.9	15	3 49	21.3	Oct. 1	2 34	10.0
9	1 21	22.3	19	3 46	19.8	5	2 28	11.7
13	0 58	24.6	23	3 42	18.1	9	2 21	13.5
17	0 34	26.7	27	3 37	16.3	13	2 14	15.2
21	+0 10	+28.6	May 1	−3 31	+14.5	17	+2 6	+17.0
25	−0 14	30.3	5	3 24	12.6	21	1 57	18.8
29	0 38	31.7	9	3 16	10.5	25	1 47	20.6
Feb. 2	1 1	32.9	13	3 7	8.4	29	1 36	22.3
6	1 23	33.8	17	2 57	6.3	Nov. 2	1 24	24.0
10	−1 44	+34.5	21	−2 45	+ 4.1	6	+1 11	+25.6
14	2 4	35.0	25	2 32	+ 1.8	10	0 58	27.2
18	2 22	35.1	29	2 19	− 0.4	14	0 43	28.6
22	2 38	35.1	June 2	2 4	2.6	18	0 28	29.9
26	2 53	34.8	6	1 48	4.7	22	+0 12	31.1
Mar. 2	−3 6	+34.2	10	−1 30	− 6.8	26	−0 5	+32.1
6	3 17	33.6	14	−1 13	− 8.7	30	0 22	33.0
10	3 26	32.7		. . .	. . .	Dec. 4	0 39	33.8
14	3 34	31.8	Aug. 30	+2 53	− 3.6	8	0 57	34.4
18	3 40	30.7	Sept. 3	2 54	1.8	12	1 15	34.9
22	−3 45	+29.5	7	+2 53	− 0.1	16	−1 32	+35.2
26	3 49	28.3	11	2 52	+ 1.6	20	1 50	35.3
30	3 51	27.0	15	2 50	3.3	24	2 7	35.2
Apr. 3	3 52	25.7	19	2 47	5.0	28	2 24	35.0
7	−3 52	+24.3	23	+2 43	+ 6.7	32	−2 41	+34.5

GREENWICH MEAN TIME.

JANUARY.

d	h	m	
1	2	18.3	I. Ec. D.
	4	35	I. Oc. R.
	18	5	II.*Tr. I.
	18	5	II.*Sh. I.
	20	47	II.*Tr. E.
	20	48	II.*Sh. E.
	23	37	I.*Tr. I.
	23	38	I.*Sh. I.
2	1	52	I. Tr. E.
	1	53	I. Sh. E.
	20	45	I.*Oc. D.
	23	2.9	I.*Ec. R.
3	2	41	III. Tr. I.
	2	50	III. Sh. I.
	5	51	III. Tr. E.
	6	1	III. Sh. E.
	12	59	II.*Oc. D.
	15	45.7	II.*Ec. R.
	18	3	I.*Tr. I.
	18	6	I.*Sh. I.
	20	18	I.*Tr. E.
	20	21	I.*Sh. E.
4	15	11	I.*Oc. D.
	17	31.6	I.*Ec. R.
5	7	12	II. Tr. I.
	7	23	II. Sh. I.
	9	54	II. Tr. E.
	10	6	II. Sh. E.
	12	29	I.*Tr. I.
	12	35	I.*Sh. I.
	14	44	I.*Tr. E.
	14	50	I.*Sh. E.
	17	37	IV.*Tr. I.
	18	34	IV.*Sh. I.
	19	49	IV.*Tr. E.
	20	49	IV.*Sh. E.
6	9	37	I. Oc. D.
	12	0.3	I.*Ec. R.
	16	6	III.*Oc. D.
	19	48.6	III.*Ec. R.
7	2	6	II. Oc. D.
	5	3.1	II. Ec. R.
	6	55	I. Tr. I.
	7	3	I. Sh. I.
	9	10	I. Tr. E.
	9	18	I. Sh. E.
8	4	3	I. Oc. D.
	6	29.0	I. Ec. R.
	20	20	II.*Tr. I.
	20	42	II.*Sh. I.
	23	2	II.*Tr. E.
	23	25	II.*Sh. E.
9	1	21	I. Tr. I.
9	1	32	I. Sh. I.
	3	36	I. Tr. E.
	3	47	I. Sh. E.
	22	29	I.*Oc. D.
10	0	57.8	I. Ec. R.
	5	56	III. Tr. I.
	6	49	III. Sh. I.
	9	6	III. Tr. E.
	10	1	III. Sh. E.
	15	12	II.*Oc. D.
	18	20.5	II.*Ec. R.
	19	47	I.*Tr. I.
	20	1	I.*Sh. I.
	22	1	I.*Tr. E.
	22	16	I.*Sh. E.
11	16	55	I.*Oc. D.
	19	26.5	I.*Ec. R.
12	9	27	II. Tr. I.
	10	0	II. Sh. I.
	12	9	II.*Tr. E.
	12	43	II.*Sh. E.
	14	13	I.*Tr. I.
	14	29	I.*Sh. I.
	16	27	I.*Tr. E.
	16	44	I.*Sh. E.
13	11	21	I.*Oc. D.
	13	55.2	I.*Ec. R.
	19	21	III.*Oc. D.
	23	48.6	III. Ec. R.
14	0	12	IV. Oc. D.
	2	23	IV. Oc. R.
	3	8.6	IV. Ec. D.
	4	19	II. Oc. D.
	5	29.0	IV. Ec. R.
	7	37.9	II. Ec. R.
	8	39	I. Tr. I.
	8	58	I. Sh. I.
	10	53	I.*Tr. E.
	11	13	I.*Sh. E.
15	5	47	I. Oc. D.
	8	23.9	I. Ec. R.
	22	35	II.*Tr. I.
	23	19	II. Sh. I.
16	1	18	II. Tr. E.
	2	3	II. Sh. E.
	3	5	I. Tr. I.
	3	26	I. Sh. I.
	5	19	I. Tr. E.
	5	41	I. Sh. E.
17	0	13	I. Oc. D.
	2	52.7	I. Ec. R.
	9	14	III. Tr. I.
	10	49	III.*Sh. I.
17	12	23	III.*Tr. E.
	14	1	III.*Sh. E.
	17	26	II.*Oc. D.
	20	55.3	II.*Ec. R.
	21	31	I.*Tr. I.
	21	55	I.*Sh. I.
	23	45	I. Tr. E.
18	0	10	I. Sh. E.
	18	39	I.*Oc. D.
	21	21.5	I.*Ec. R.
19	11	43	II.*Tr. I.
	12	38	II.*Sh. I.
	14	26	II.*Tr. E.
	15	21	II.*Sh. E.
	15	57	I.*Tr. I.
	16	24	I.*Sh. I.
	18	11	I.*Tr. E.
	18	38	I.*Sh. E.
20	13	6	I.*Oc. D.
	15	50.3	I.*Ec. R.
	22	39	III.*Oc. D.
21	3	48.9	III. Ec. R.
	6	33	II. Oc. D.
	10	12.8	II. Ec. R.
	10	23	I. Tr. I.
	10	52	I.*Sh. I.
	12	38	I.*Tr. E.
	13	7	I.*Sh. E.
22	7	32	I. Oc. D.
	7	51	IV. Tr. I.
	10	4	IV. Tr. E.
	10	19.0	I. Ec. R.
	12	32	IV.*Sh. I.
	15	1	IV.*Sh. E.
23	0	52	II. Tr. I.
	1	57	II. Sh. I.
	3	35	II. Tr. E.
	4	40	II. Sh. E.
	4	49	I. Tr. I.
	5	21	I. Sh. I.
	7	4	I. Tr. E.
	7	36	I. Sh. E.
24	1	58	I. Oc. D.
	4	47.9	I. Ec. R.
	12	33	III.*Tr. I.
	14	48	III.*Sh. I.
	15	42	III.*Tr. E.
	18	2	III.*Sh. E.
	19	41	II.*Oc. D.
	23	16	I. Tr. I.
	23	30.2	II. Ec. R.
	23	49	I. Sh. I.
25	1	30	I. Tr. E.
25	2	4	I. Sh. E.
	20	25	I.*Oc. D.
	23	16.6	I. Ec. R.
26	14	1	II.*Tr. I.
	15	15	II.*Sh. I.
	16	43	II.*Tr. E.
	17	42	I.*Tr. I.
	17	58	II.*Sh. E.
	18	18	I.*Sh. I.
	19	56	I.*Tr. E.
	20	33	I.*Sh. E.
27	14	51	I.*Oc. D.
	17	45.5	I.*Ec. R.
28	2	0	III. Oc. D.
	7	49.9	III. Ec. R.
	8	49	II. Oc. D.
	12	8	I.*Tr. I.
	12	47	I.*Sh. I.
	12	47.7	II.*Ec. R.
	14	23	I.*Tr. E.
	15	1	I.*Sh. E.
29	9	17	I. Oc. D.
	12	14.2	I.*Ec. R.
30	3	11	II. Tr. I.
	4	34	II. Sh. I.
	5	53	II. Tr. E.
	6	35	I. Tr. I.
	7	15	I. Sh. I.
	7	18	II. Sh. E.
	8	49	I. Tr. E.
	9	30	I. Sh. E.
	14	37	IV.*Oc. D.
	16	50	IV.*Oc. R.
	21	9.3	IV.*Ec. D.
	23	43.6	IV. Ec. R.
31	3	44	I. Oc. D.
	6	43.1	I. Ec. R.
	15	55	III.*Tr. I.
	18	48	III.*Sh. I.
	19	5	III.*Tr. E
	21	58	II. Oc. D.
	22	2	III. Sh. E.

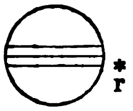
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; *Tr., transit of the satellite;* Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

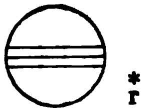
JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

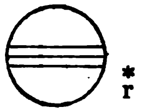
I.



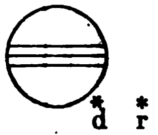
III.



II.



IV.



Configurations at 16^h 15^m for an Inverting Telescope.

Day.	West.		East.
1		○	2• 1• 3• 4•
2	2• •1	○	3• 4•
3	3•	○	1• •2 4•
4	3•	○	2•4• •1●
5	•3 2• 1•	4• ○	
6	4• •2	○	•1 •3●
7	4• 1•	○	•2 •3
8	4•	○	2• 1• 3•
9	4• 2• •1	○	3•
10	•4 3•	○	1• •2●
11	•4 3•	•○	1 2•
12	○1• •3 •4 2•	○	
13	•2 •3 •4	○	•1
14	1•	○	•2 •4 •3
15		○	2•1 3• •4
16	2• •1	○	3• •4
17	3•	•○	2 1• •4
18	3• •1	○	2• 4•
19	○1• •3 2•	○	4•
20	•2 •3	○	•1 4•
21	1•	○	4• •2 •3
22	4•	○	2• •1 •3
23	4• 2• 1•	○	3•
24	4• 3• •2	○	1•
25	4• 3• •1	○	•2
26	○2• •4 •3	○	1•
27	•4 •2 •3	○	•1●
28	•4 1•	○	•2 •3
29	•4	○	•12• •3
30	2•1•	○	3• •4●
31	○3• •2	○	1• •4

GREENWICH MEAN TIME.

FEBRUARY.

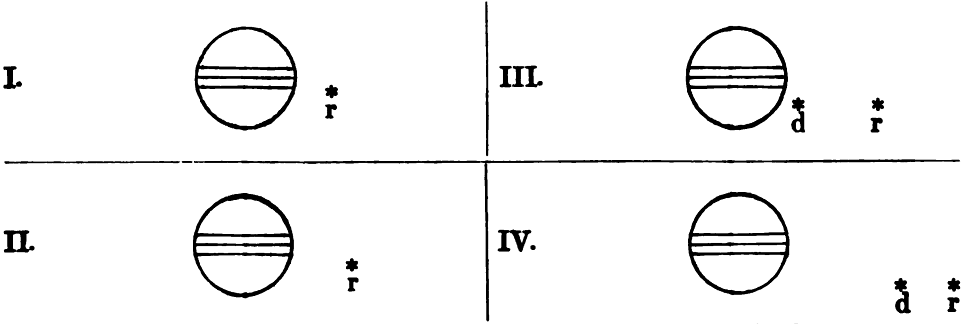
d	h	m	
1	1	1	I. Tr. I.
	1	44	I. Sh. I.
	2	5.2	II. Ec. R.
	3	15	I. Tr. E.
	3	59	I. Sh. E.
	22	11	I. Oc. D.
2	1	11.9	I. Ec. R.
	16	20	II.*Tr. I.
	17	53	II.*Sh. I.
	19	2	II.*Tr. E.
	19	28	I.*Tr. I.
	20	13	I.*Sh. I.
	20	36	II.*Sh. E.
	21	42	I.*Tr. E.
	22	27	I. Sh. E.
3	16	37	I.*Oc. D.
	19	40.8	I.*Ec. R.
4	5	24	III. Oc. D.
	11	7	II.*Oc. D.
	11	50.9	III.*Ec. R.
	13	54	I.*Tr. I.
	14	41	I.*Sh. I.
	15	22.7	II.*Ec. R.
	16	9	I.*Tr. E.
	16	56	I.*Sh. E.
5	11	4	I.*Oc. D.
	14	9.6	I.*Ec. R.
6	5	31	II. Tr. I.
	7	12	II. Sh. I.
	8	13	II. Tr. E.
	8	21	I. Tr. I.
	9	10	I. Sh. I.
	9	56	II. Sh. E.
	10	35	I. Tr. E.
	11	25	I.*Sh. E.
7	5	31	I. Oc. D.
	8	38.5	I. Ec. R.
	19	22	III.*Tr. I.
	22	31	III. Tr. E.
	22	41	IV. Tr. I.
	22	47	III. Sh. I.
8	0	16	II. Oc. D.
	0	57	IV. Tr. E.
	2	2	III. Sh. E.
	2	48	I. Tr. I.
	3	39	I. Sh. I.
	4	40.2	II. Ec. R.
	5	2	I. Tr. E.
	5	53	I. Sh. E.
	6	31	IV. Sh. I.
	9	12	IV. Sh. E.
	23	58	I. Oc. D.
9	3	7.3	I. Ec. R.
9	18	42	II.*Tr. I.
	20	30	II.*Sh. I.
	21	15	I. Tr. I.
	21	24	II. Tr. E.
	22	7	I. Sh. I.
	23	14	II. Sh. E.
	23	29	I. Tr. E.
10	0	22	I. Sh. E.
	18	25	I.*Oc. D.
	21	36.2	I. Ec. R.
11	8	54	III. Oc. D.
	12	5	III.*Oc. R.
	12	35.6	III.*Ec. D.
	13	27	II.*Oc. D.
	15	42	I.*Tr. I.
	15	52.6	III.*Ec. R.
	16	36	I.*Sh. I.
	17	56	I.*Tr. E.
	17	57.8	II.*Ec. R.
	18	51	I.*Sh. E.
12	12	52	I.*Oc. D.
	16	5.0	I.*Ec. R.
13	7	54	II. Tr. I.
	9	50	II. Sh. I.
	10	9	I. Tr. I.
	10	36	II. Tr. E.
	11	5	I. Sh. I.
	12	23	I.*Tr. E.
	12	34	II.*Sh. E.
	13	19	I.*Sh. E.
14	7	19	I. Oc. D.
	10	33.9	I. Ec. R.
	22	52	III. Tr. I.
15	2	1	III. Tr. E.
	2	37	II. Oc. D.
	2	46	III. Sh. I.
	4	36	I. Tr. I.
	5	33	I. Sh. I.
	6	2	III. Sh. E.
	6	50	I. Tr. E.
	7	15.3	II. Ec. R.
	7	48	I. Sh. E.
16	1	46	I. Oc. D.
	5	2.8	I. Ec. R.
	5	48	IV. Oc. D.
	8	6	IV. Oc. R.
	15	11.0	IV.*Ec. D.
	17	57.8	IV.*Ec. R.
	21	6	II. Tr. I.
	23	3	I. Tr. I.
	23	8	II. Sh. I.
	23	48	II. Tr. E.
17	0	2	I. Sh. I.
17	1	17	I. Tr. E.
	1	52	II. Sh. E.
	2	17	I. Sh. E.
	20	13	I.*Oc. D.
	23	31.7	I. Ec. R.
18	12	27	III.*Oc. D.
	15	38	III.*Oc. R.
	15	48	II.*Oc. D.
	16	35.8	III.*Ec. D.
	17	30	I.*Tr. I.
	18	31	I.*Sh. I.
	19	44	I.*Tr. E.
	19	53.7	III.*Ec. R.
	20	32.9	II.*Ec. R.
	20	45	I. Sh. E.
19	14	41	I.*Oc. D.
	18	0.5	I.*Ec. R.
20	10	19	II. Tr. I.
	11	57	I.*Tr. I.
	12	28	II.*Sh. I.
	12	59	I.*Sh. I.
	13	1	II.*Tr. E.
	14	11	I.*Tr. E.
	15	12	II.*Sh. E.
	15	14	I.*Sh. E.
21	9	8	I. Oc. D.
	12	29.5	I.*Ec. R.
22	2	28	III. Tr. I.
	5	0	II. Oc. D.
	5	37	III. Tr. E.
	6	25	I. Tr. I.
	6	46	III. Sh. I.
	7	28	I. Sh. I.
	8	38	I. Tr. E.
	9	43	I. Sh. E.
	9	50.4	II. Ec. R.
	10	2	III. Sh. E.
23	3	36	I. Oc. D.
	6	58.3	I. Ec. R.
	23	32	II. Tr. I.
24	0	52	I. Tr. I.
	1	46	II. Sh. I.
	1	57	I. Sh. I.
	2	14	II. Tr. E.
	3	6	I. Tr. E.
	4	11	I. Sh. E.
	4	30	II. Sh. E.
	14	22	IV.*Tr. I.
	16	44	IV.*Tr. E.
	22	3	I. Oc. D.
25	0	31	IV. Sh. I.
	1	27.3	I. Ec. R.
	3	23	IV. Sh. E.
25	16	5	III.*Oc
	18	13	II.*Oc
	19	16	III.*Oc
	19	19	I.*Tr.
	20	26	I. Sh.
	20	35.8	III. Ec
	21	33	I. Tr.
	22	40	I. Sh.
	23	8.1	II. Ec.
	23	54.5	III. Ec.
26	16	31	I.*Oc.
	19	56.1	I.*Ec
27	12	47	II.*Tr.
	13	47	I.*Tr.
	14	54	I.*Sh.
	15	6	II.*Sh.
	15	29	II.*Tr.
	16	1	I.*Tr.
	17	9	I.*Sh.
	17	50	II.*Sh.
28	10	59	I. Oc.
	14	25.1	I.*Ec

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultat
Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 15h 45m for an Inverting Telescope.

Day.	West.	East.
1	3• •1	•2 •4
2	•3 2	• 1• •4
3	•2•3 •	1 •4
4	○1•	•2 •3 4•
5		•1 2• •3 4•
6	2• 1•	4• 3•
7	•2	4• 3• •1
8	3• 4• •1	•2
9	4• •3	2•1•
10	4• 2• •3 •1	
11	○1• 4•	•2 ● •3 ●
12	•4	2• •3 •1 ●
13	•4 2• 1•	3•
14	•4 •2	3• •1
15	3• 1• •4	•2
16	3•	2• 1• •4 ●
17	•3 2• •1	•4
18	•	1• 2 •3 •4
19		2• •3 •4 •1 ●
20	2• 1•	3• 4•
21	•2	•1 2• 4•
22	3• 1•	•2 4•
23	3•	2• 1• 4•
24	○4. •3 2• •1	
25	4• •2 •	3 1•
26	4• •	1 •4 •3
27	○1• 4• 2•	3•
28	4• •2	•1 3•

SATELLITES OF JUPITER, 1919.

GREENWICH MEAN TIME.

MARCH.

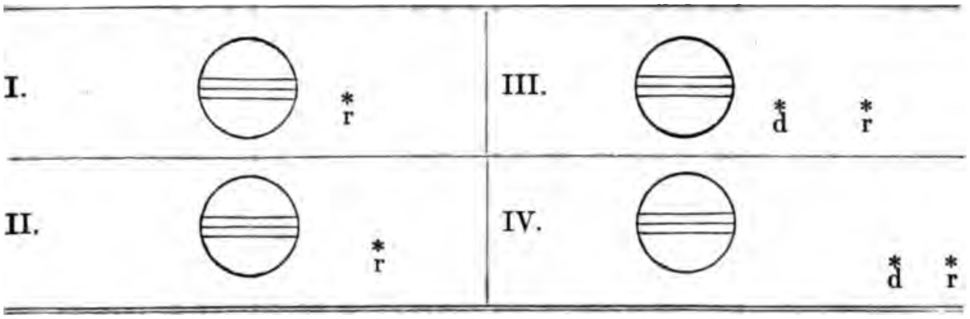
d	h	m		d	h	m		d	h	m		d	h	m	
1	6	8	III. Tr. I.	8	13	32	I.*Sh. E.	16	12	45.2	I.*Ec. R.	24	11	51	I. Sh
	7	26	II. Oc. D.		14	46	III.*Sh. I.						12	19	II.*Sh
	8	15	I. Tr. I.		15	1.0	II.*Ec. R.	17	6	27	I. Tr. I.		12	24	II.*Tr
	9	17	III. Tr. E.		18	4	III.*Sh. E.		7	6	II. Tr. I.		15	3	II.*Sh
	9	23	I. Sh. I.						7	41	I. Sh. I.				
	10	29	I. Tr. E.	9	7	18	I. Oc. D.		8	41	I. Tr. E.	25	5	35	I. Oc
	10	46	III. Sh. I.		10	49.6	I. Ec. R.		9	41	II. Sh. I.		9	9.9	I. Ec
	11	37	I.*Sh. E.						9	48	II. Tr. E.				
	12	25.7	II.*Ec. R.	10	4	32	II. Tr. I.		9	56	I. Sh. E.	26	2	49	I. Tr
	14	3	III.*Sh. E.		4	34	I. Tr. I.		12	25	II.*Sh. E.		4	5	I. Sh
					5	47	I. Sh. I.						4	13	II. Oc
2	5	26	I. Oc. D.		6	48	I. Tr. E.	18	3	40	I. Oc. D.		5	3	I. Tr.
	8	53.9	I. Ec. R.		7	3	II. Sh. I.		7	14.2	I. Ec. R.		6	20	I. Sh
					7	14	II. Tr. E.						7	23	III. Oc
3	2	1	II. Tr. I.		8	1	I. Sh. E.	19	0	55	I. Tr. I.		9	29.4	II. Ec
	2	42	I. Tr. I.		9	47	II. Sh. E.		1	39	II. Oc. D.		10	38	III. Oc
	3	52	I. Sh. I.						2	10	I. Sh. I.		12	36.4	III.*Ec
	4	25	II. Sh. I.	11	1	47	I. Oc. D.		3	9	I. Tr. E.		15	58.3	III.*Ec
	4	43	II. Tr. E.		5	18.6	I. Ec. R.		3	26	III. Oc. D.				
	4	56	I. Tr. E.		23	2	I. Tr. I.		4	25	I. Sh. E.	27	0	3	I. Oc
	6	6	I. Sh. E.		23	8	II. Oc. D.		6	40	III. Oc. R.		3	38.7	I. Ec
	7	8	II. Sh. E.		23	34	III. Oc. D.		6	54.0	II. Ec. R.		21	18	I. Tr.
	23	54	I. Oc. D.						8	36.0	III. Ec. D.		22	34	I. Sh.
				12	0	15	I. Sh. I.		11	57.1	III.*Ec. R.		23	1	II. Tr.
4	3	22.9	I. Ec. R.		1	16	I. Tr. E.		22	9	I. Oc. D.		23	32	I. Tr.
	19	47	III. Oc. D.		2	30	I. Sh. E.								
	20	39	II. Oc. D.		2	47	III. Oc. R.	20	1	43.0	I. Ec. R.	28	0	48	I. Sh.
	21	10	I. Tr. I.		4	18.6	II. Ec. R.		19	24	I. Tr. I.		1	38	II. Sh.
	21	58	IV. Oc. D.		4	35.4	III. Ec. D.		20	24	II. Tr. I.		1	43	II. Tr.
	22	20	I. Sh. I.		7	55.8	III. Ec. R.		20	39	I. Sh. I.		4	23	II. Sh.
	22	59	III. Oc. R.		20	15	I. Oc. D.		21	37	I. Tr. E.		18	32	I. Oc
	23	24	I. Tr. E.		23	47.4	I. Ec. R.		22	53	I. Sh. E.		22	7.6	I. Ec
									23	0	II. Sh. I.				
5	0	23	IV. Oc. R.	13	7	4	IV. Tr. I.		23	6	II. Tr. E.	29	15	47	I.*Tr.
	0	35	I. Sh. E.		9	32	IV. Tr. E.						17	3	I.*Sh.
	0	35.5	III. Ec. D.		17	30	I.*Tr. I.	21	1	44	II. Sh. E.		17	30	II.*Oc
	1	43.3	II. Ec. R.		17	49	II.*Tr. I.		15	9	IV.*Oc. D.		18	0	I.*Tr.
	3	55.0	III. Ec. R.		18	32	IV.*Sh. I.		16	37	I.*Oc. D.		19	17	I. Sh.
	9	13.8	IV. Ec. D.		18	44	I.*Sh. I.		17	42	IV.*Oc. R.		21	35	III. Tr.
	12	12.3	IV.*Ec. R.		19	44	I. Tr. E.		20	12.0	I. Ec. R.		22	47.2	II. Ec
	18	22	I.*Oc. D.		20	22	II. Sh. I.								
	21	51.7	I. Ec. R.		20	31	II. Tr. E.	22	3	16.9	IV. Ec. D.	30	0	42	IV. Tr.
					20	58	I. Sh. E.		6	25.9	IV. Ec. R.		0	47	III. Tr.
6	15	17	II.*Tr. I.		21	33	IV. Sh. E.		13	52	I.*Tr. I.		2	46	III. Sh.
	15	38	I.*Tr. I.		23	6	II. Sh. E.		14	56	II.*Oc. D.		3	19	IV. Tr.
	16	49	I.*Sh. I.						15	8	I.*Sh. I.		6	5	III. Sh.
	17	44	II.*Sh. I.	14	14	43	I.*Oc. D.		16	6	I.*Tr. E.		12	33	IV.*Sh.
	17	52	I.*Tr. E.		18	16.3	I.*Ec. R.		17	22	I.*Sh. E.		13	1	I.*Oc
	17	59	II.*Tr. E.						17	37	III.*Tr. I.		15	44	IV.*Sh.
	19	3	I.*Sh. E.	15	11	59	I.*Tr. I.		20	11.7	II. Ec. R.		16	36.5	I.*Ec
	20	28	II. Sh. E.		12	23	II.*Oc. D.		20	48	III. Tr. E.				
					13	13	I.*Sh. I.		22	46	III. Sh. I.	31	10	15	I. Tr.
7	12	50	I.*Oc. D.		13	43	III.*Tr. I.						11	31	I. Sh.
	16	20.7	I.*Ec. R.		14	12	I.*Tr. E.	23	2	5	III. Sh. E.		12	20	II.*Tr.
					15	27	I.*Sh. E.		11	6	I. Oc. D.		12	29	I.*Tr.
8	9	53	III. Tr. I.		16	53	III.*Tr. E.		14	40.9	I.*Ec. R.		13	46	I.*Sh.
	9	53	II. Oc. D.		17	36.3	II.*Ec. R.						14	57	II.*Sh.
	10	6	I. Tr. I.		18	46	III.*Sh. I.	24	8	21	I. Tr. I.		15	2	II.*Tr.
	11	18	I. Sh. I.		22	4	III. Sh. E.		9	36	I. Sh. I.		17	41	II.*Sh.
	12	20	I.*Tr. E.						9	42	II. Tr. I.				
	13	3	III.*Tr. E.	16	9	12	I. Oc. D.		10	34	I. Tr. E.				

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultat
Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 15h 15m for an Inverting Telescope.

Day.	West.		East.
1	·4 3· 1·	○	·2
2	·4 3·	○	2· ·1
3	·3 ·4 2· ·1	○	
4	·2 ·3 ·4	○	1·
5	·1	○	·4 ·2 ·3
6	2 1	○	· ·3 ·4
7	·2	○	3· ·4 ·1 ●
8	1· 3·	○	·2 ·4
9	3·	○	·1 2· 4·
10	·3 2· 1·	○	4·
11	·2 ·3	○	1· 4·
12	·1	○	4· ·2 ·3
13	4·	○	2· 1· ·3
14	4· 2·	○	3· ·1 ●
15	○ 3· 4· 1·	○	·2 ●
16	4· 3·	○	·1 2·
17	·4 ·3 2· 1·	○	
18	·4 ·2 ·3	○	·1
19	·4 ·1	○	·3 ·2
20	·4	○	2· 1· ·3
21	2·	○	1 3· ·4 ●
22	○ 1· 3	○	· ·4 ·2 ●
23	3·	○	·1 2· ·4
24	·3 1·2·	○	·4
25	·3 ·2	○	·1 ·4
26	·1	○	·2 4· ·3 ●
27		○	2· 1· ·3 4·
28	2· ·1	○	4· 3.
29	1 ·2	○	· 4· 3·
30	3· 4·	○	·2 ·1 ●
31	4· 3· 1· 2·	○	

GREENWICH MEAN TIME.

APRIL.

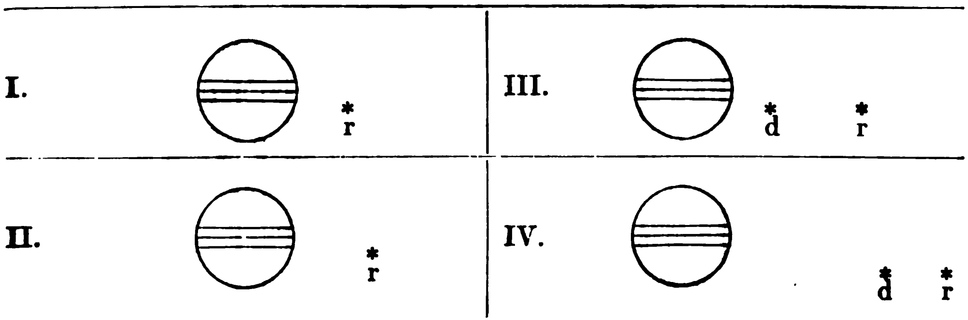
d	h	m	
1	7	30	I. Oc. D.
	11	5.5	I. Ec. R.
2	4	44	I. Tr. I.
	6	0	I. Sh. I.
	6	48	II. Oc. D.
	6	58	I. Tr. E.
	8	15	I. Sh. E.
	11	25	III. Oc. D.
	12	5.0	II.*Ec. R.
	14	40	III.*Oc. R.
	16	37.4	III.*Ec. D.
	20	0.1	III. Ec. R.
3	1	59	I. Oc. D.
	5	34.3	I. Ec. R.
	23	13	I. Tr. I.
4	0	29	I. Sh. I.
	1	27	I. Tr. E.
	1	40	II. Tr. I.
	2	43	I. Sh. E.
	4	16	II. Sh. I.
	4	22	II. Tr. E.
	7	1	II. Sh. E.
	20	28	I. Oc. D.
5	0	3.3	I. Ec. R.
	17	42	I. Tr. I.
	18	58	I. Sh. I.
	19	56	I. Tr. E.
	20	6	II. Oc. D.
	21	12	I. Sh. E.
6	1	22.8	II. Ec. R.
	1	37	III. Tr. I.
	4	50	III. Tr. E.
	6	45	III. Sh. I.
	10	6	III. Sh. E.
	14	57	I.*Oc. D.
	18	32.1	I. Ec. R.
7	9	15	IV. Oc. D.
	11	58	IV. Oc. R.
	12	11	I.*Tr. I.
	13	26	I.*Sh. I.
	14	25	I.*Tr. E.
	14	59	II.*Tr. I.
	15	41	I.*Sh. E.
	17	35	II. Sh. I.
	17	42	II. Tr. E.
	20	20	II. Sh. E.
	21	19.9	IV. Ec. D.
8	0	38.6	IV. Ec. R.
	9	27	I. Oc. D.
	13	1.1	I.*Ec. R.
9	6	40	I. Tr. I.
	7	55	I. Sh. I.
	8	54	I. Tr. E.
	9	25	II. Oc. D.
9	10	10	I. Sh. E.
	14	40.6	II.*Ec. R.
	15	30	III.*Oc. D.
	18	46	III. Oc. R.
	20	37.6	III. Ec. D.
10	0	1.2	III. Ec. R.
	3	56	I. Oc. D.
	7	29.9	I. Ec. R.
11	1	9	I. Tr. I.
	2	24	I. Sh. I.
	3	23	I. Tr. E.
	4	20	II. Tr. I.
	4	39	I. Sh. E.
	6	54	II. Sh. I.
	7	3	II. Tr. E.
	9	39	II. Sh. E.
	22	25	I. Oc. D.
12	1	58.9	I. Ec. R.
	19	39	I. Tr. I.
	20	53	I. Sh. I.
	21	53	I. Tr. E.
	22	45	II. Oc. D.
	23	7	I. Sh. E.
13	3	58.4	II. Ec. R.
	5	43	III. Tr. I.
	8	57	III. Tr. E.
	10	45	III. Sh. I.
	14	6	III.*Sh. E.
	16	55	I.*Oc. D.
	20	27.7	I. Ec. R.
14	14	8	I.*Tr. I.
	15	21	I.*Sh. I.
	16	22	I.*Tr. E.
	17	36	I. Sh. E.
	17	41	II. Tr. I.
	20	13	II. Sh. I.
	20	24	II. Tr. E.
	22	58	II. Sh. E.
15	11	24	I. Oc. D.
	14	56.7	I.*Ec. R.
	19	10	IV. Tr. I.
	21	57	IV. Tr. E.
16	6	34	IV. Sh. I.
	8	37	I. Tr. I.
	9	50	I. Sh. I.
	9	53	IV. Sh. E.
	10	51	I. Tr. E.
	12	4	II. Oc. D.
	12	5	I. Sh. E.
	17	16.3	II. Ec. R.
	19	38	III. Oc. D.
	22	55	III. Oc. R.
17	0	37.6	III. Ec. D.
	4	1.8	III. Ec. R.
17	5	54	I. Oc. D.
	9	25.5	I. Ec. R.
18	3	6	I. Tr. I.
	4	19	I. Sh. I.
	5	21	I. Tr. E.
	6	34	I. Sh. E.
	7	3	II. Tr. I.
	9	32	II. Sh. I.
	9	46	II. Tr. E.
	12	17	II.*Sh. E.
19	0	23	I. Oc. D.
	3	54.4	I. Ec. R.
	21	36	I. Tr. I.
	22	48	I. Sh. I.
	23	50	I. Tr. E.
20	1	3	I. Sh. E.
	1	24	II. Oc. D.
	6	34.1	II. Ec. R.
	9	53	III. Tr. I.
	13	7	III.*Tr. E.
	14	45	III.*Sh. I.
	18	7	III. Sh. E.
	18	53	I. Oc. D.
	22	23.2	I. Ec. R.
21	16	5	I.*Tr. I.
	17	16	I. Sh. I.
	18	19	I. Tr. E.
	19	31	I. Sh. E.
	20	24	II. Tr. I.
	22	50	II. Sh. I.
	23	7	II. Tr. E.
22	1	36	II. Sh. E.
	13	22	I.*Oc. D.
	16	52.1	I. Ec. R.
23	10	35	I. Tr. I.
	11	45	I. Sh. I.
	12	49	I.*Tr. E.
	14	0	I.*Sh. E.
	14	45	II.*Oc. D.
	19	52.0	II. Ec. R.
	23	49	III. Oc. D.
24	3	6	III. Oc. R.
	4	9	IV. Oc. D.
	4	37.3	III. Ec. D.
	7	2	IV. Oc. R.
	7	52	I. Oc. D.
	8	2.1	III. Ec. R.
	11	21.0	I. Ec. R.
	15	23.5	IV.*Ec. D.
	18	51.5	IV. Ec. R.
25	5	4	I. Tr. I.
	6	14	I. Sh. I.
	7	18	I. Tr. E.
	8	29	I. Sh. E.
25	9	46	II. Tr. I.
	12	10	II. Sh. I.
	12	30	II.*Tr. E.
	14	55	II.*Sh. E.
26	2	22	I. Oc. D.
	5	49.9	I. Ec. R
	23	34	I. Tr. I
27	0	43	I. Sh. I
	1	48	I. Tr. E.
	2	58	I. Sh. E.
	4	6	II. Oc. D.
	9	9.9	II. Ec. R
	14	5	III.*Tr. I.
	17	21	III. Tr. E.
	18	45	III. Sh. I.
	20	51	I. Oc. D
	22	8	III. Sh. E
28	0	18.7	I. Ec. R
	18	3	I. Tr. I.
	19	11	I. Sh. I.
	20	18	I. Tr. E
	21	26	I. Sh. E
	23	8	II. Tr. I.
29	1	28	II. Sh. I.
	1	52	II. Tr. E
	4	13	II. Sh. E
	15	21	I.*Oc. D
	18	47.6	I. Ec. R
30	12	33	I.*Tr. I.
	13	40	I.*Sh. I
	14	47	I.*Tr. E
	15	55	I.*Sh. E
	17	27	II. Oc. D
	22	27.9	II. Ec. R

Note.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultatio
ansit of the satellite; Sh., transit of the shadow. *Visible at Washington.

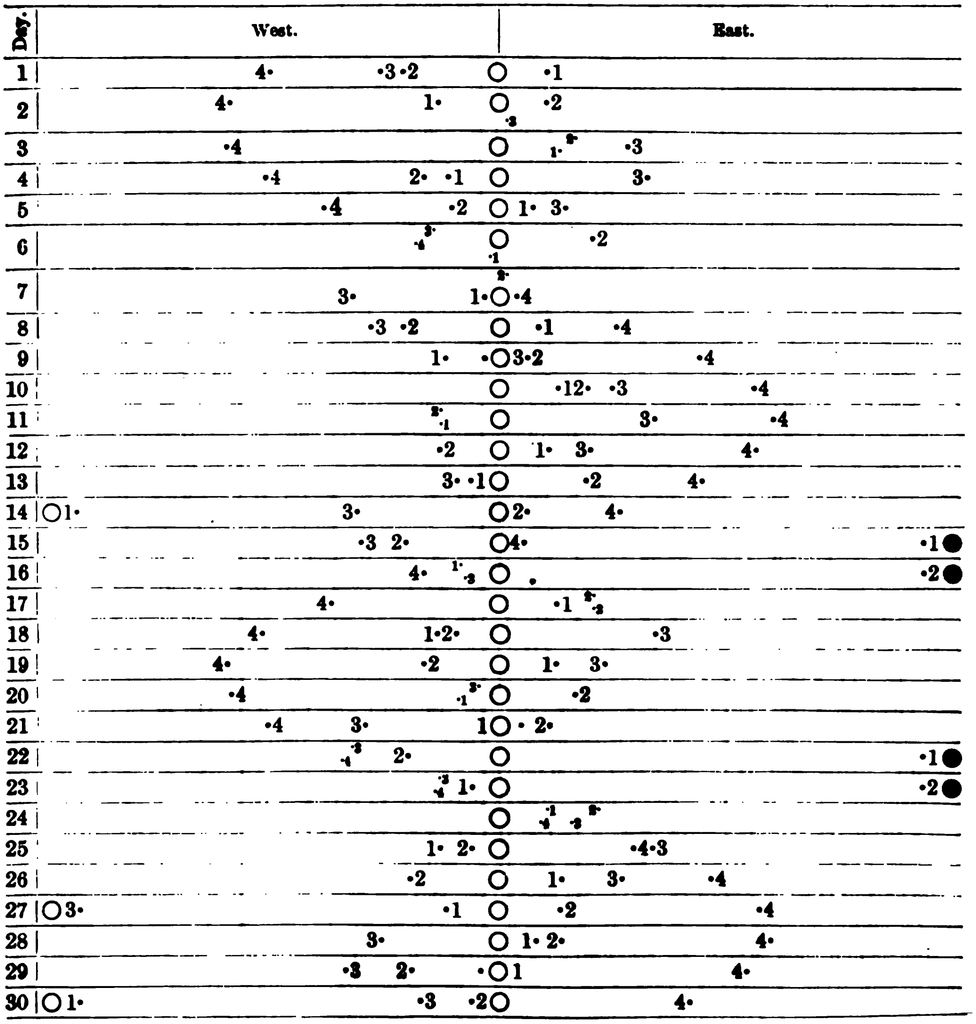
GREENWICH MEAN TIME.

APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 14ʰ 45ᵐ for an Inverting Telescope.



GREENWICH MEAN TIME.

MAY.

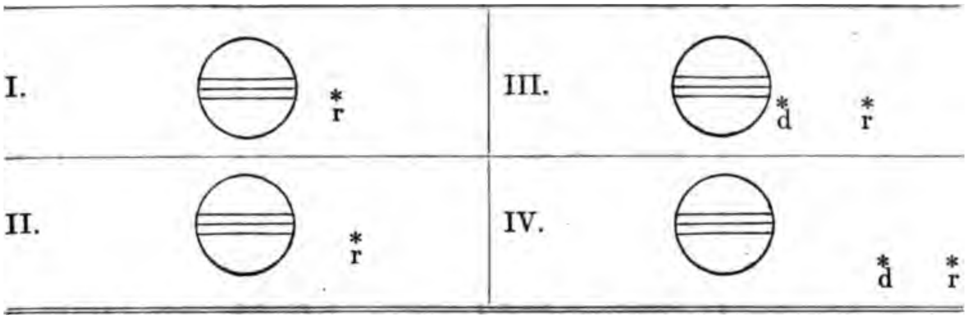
d	h	m	
1	4	2	III. Oc. D.
	7	21	III. Oc. R.
	8	36.8	III. Ec. D.
	9	51	I. Oc. D.
	12	2.5	III. Ec. R.
	13	16.4	I.*Ec. R.
2	7	2	I. Tr. I.
	8	9	I. Sh. I.
	9	17	I. Tr. E.
	10	24	I. Sh. E.
	12	31	II.*Tr. I.
	14	18	IV.*Tr. I.
	14	47	II.*Sh. I.
	15	15	II.*Tr. E.
	17	17	IV. Tr. E.
	17	33	II. Sh. E.
3	0	35	IV. Sh. I.
	4	3	IV. Sh. E.
	4	21	I. Oc. D.
	7	45.2	I. Ec. R.
4	1	32	I. Tr. I.
	2	38	I. Sh. I.
	3	47	I. Tr. E.
	4	53	I. Sh. E.
	6	49	II. Oc. D.
	11	45.8	II. Ec. R.
	18	20	III. Tr. I.
	21	37	III. Tr. E.
	22	45	III. Sh. I.
	22	50	I. Oc. D.
5	2	9	III. Sh. E.
	2	14.0	I. Ec. R.
	20	2	I. Tr. I.
	21	6	I. Sh. I.
	22	17	I. Tr. E.
	23	22	I. Sh. E.
6	1	54	II. Tr. I.
	4	5	II. Sh. I.
	4	38	II. Tr. E.
	6	51	II. Sh. E.
	17	20	I. Oc. D.
	20	42.9	I. Ec. R.
7	14	32	I.*Tr. I.
	15	35	I.*Sh. I.
	16	46	I. Tr. E.
	17	50	I. Sh. E.
	20	11	II. Oc. D.
8	1	3.8	II. Ec. R.
	8	19	III. Oc. D.
	11	39	III. Oc. R.
	11	50	I. Oc. D.
	12	37.1	III.*Ec. D.
8	15	11.7	I.*Ec. R.
	16	3.4	III. Ec. R.
9	9	1	I. Tr. I.
	10	4	I. Sh. I.
	11	16	I. Tr. E.
	12	19	I. Sh. E.
	15	17	II.*Tr. I.
	17	24	II. Sh. I.
	18	1	II. Tr. E.
	20	10	II. Sh. E.
10	6	20	I. Oc. D.
	9	40.6	I. Ec. R.
	23	39	IV. Oc. D.
11	2	45	IV. Oc. R.
	3	31	I. Tr. I.
	4	32	I. Sh. I.
	5	46	I. Tr. E.
	6	48	I. Sh. E.
	9	26.7	IV. Ec. D.
	9	33	II. Oc. D.
	13	3.0	IV.*Ec. R.
	14	21.7	II.*Ec. R.
	22	38	III. Tr. I.
12	0	50	I. Oc. D.
	1	56	III. Tr. E.
	2	45	III. Sh. I.
	4	9.3	I. Ec. R.
	6	9	III. Sh. E.
	22	1	I. Tr. I.
	23	1	I. Sh. I.
13	0	16	I. Tr. E.
	1	17	I. Sh. E.
	4	40	II. Tr. I.
	6	43	II. Sh. I.
	7	24	II. Tr. E.
	9	28	II. Sh. E.
	19	20	I. Oc. D.
	22	38.2	I. Ec. R.
14	16	31	I. Tr. I.
	17	30	I. Sh. I.
	18	46	I. Tr. E.
	19	45	I. Sh. E.
	22	55	II. Oc. D.
15	3	39.8	II. Ec. R.
	12	38	III. Oc. D.
	13	50	I.*Oc. D.
	15	59	III. Oc. R.
	16	37.2	III. Ec. D.
	17	7.0	I. Ec. R.
	20	4.2	III. Ec. R.
16	11	1	I. Tr. I.
16	11	59	I. Sh. I.
	13	16	I.*Tr. E.
	14	14	I.*Sh. E.
	18	4	II. Tr. I.
	20	1	II. Sh. I.
	20	48	II. Tr. E.
	22	47	II. Sh. E.
17	8	20	I. Oc. D.
	11	35.8	I. Ec. R.
18	5	31	I. Tr. I.
	6	27	I. Sh. I.
	7	46	I. Tr. E.
	8	43	I. Sh. E.
	12	18	II. Oc. D.
	16	57.8	II. Ec. R.
19	2	50	I. Oc. D.
	2	57	III. Tr. I.
	6	4.6	I. Ec. R.
	6	17	III. Tr. E.
	6	44	III. Sh. I.
	9	59	IV. Tr. I.
	10	10	III. Sh. E.
	13	9	IV.*Tr. E.
	18	35	IV. Sh. I.
	22	12	IV. Sh. E.
20	0	1	I. Tr. I.
	0	56	I. Sh. I.
	2	16	I. Tr. E.
	3	12	I. Sh. E.
	7	27	II. Tr. I.
	9	20	II. Sh. I.
	10	12	II. Tr. E.
	12	6	II. Sh. E.
	21	21	I. Oc. D.
21	0	33.4	I. Ec. R.
	18	31	I. Tr. I.
	19	25	I. Sh. I.
	20	46	I. Tr. E.
	21	41	I. Sh. E.
22	1	41	II. Oc. D.
	6	15.9	II. Ec. R.
	15	51	I. Oc. D.
	17	0	III. Oc. D.
	19	2.1	I. Ec. R.
	20	22	III. Oc. R.
	20	37.8	III. Ec. D.
23	0	5.4	III. Ec. R.
	13	1	I.*Tr. I.
	13	53	I.*Sh. I.
	15	16	I. Tr. E.
	16	9	I. Sh. E.
	20	52	II. Tr. I.
23	22	38	II. Sh. I.
	23	36	II. Tr. E.
24	1	24	II. Sh. E.
	10	21	I. Oc. D.
	13	30.9	I.*Ec. R.
25	7	31	I. Tr. I.
	8	22	I. Sh. I.
	9	46	I. Tr. E.
	10	38	I. Sh. E.
	15	4	II. Oc. D.
	19	33.9	II. Ec. R.
26	4	51	I. Oc. D.
	7	18	III. Tr. I.
	7	59.7	I. Ec. R.
	10	39	III. Tr. E.
	10	44	III. Sh. I.
	14	10	III.*Sh. E.
27	2	1	I. Tr. I.
	2	51	I. Sh. I.
	4	16	I. Tr. E.
	5	7	I. Sh. E.
	10	15	II. Tr. I.
	11	56	II. Sh. I.
	13	0	II.*Tr. E.
	14	43	II.*Sh. E.
	19	38	IV. Oc. D.
	22	57	IV. Oc. R.
	23	21	I. Oc. D.
28	2	28.5	I. Ec. R.
	3	29.4	IV. Ec. D.
	7	13.6	IV. Ec. R.
	20	31	I. Tr. I.
	21	20	I. Sh. I.
	22	46	I. Tr. E.
	23	36	I. Sh. E.
29	4	28	II. Oc. D.
	8	52.0	II. Ec. R.
	17	51	I. Oc. D.
	20	57.2	I. Ec. R.
	21	23	III. Oc. D.
30	4	5.7	III. Ec. R.
	15	1	I. Tr. I.
	15	48	I. Sh. I.
	17	17	I. Tr. E.
	18	4	I. Sh. E.
	23	40	II. Tr. I.
31	1	15	II. Sh. I.
	2	25	II. Tr. E.
	4	1	II. Sh. E.
	12	22	I. Oc. D.
	15	26.0	I. Ec. R.

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

MAY

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 14h 15m for an Inverting Telescope.

Day.	West.		East.
1		○	·1·3 4· ·2
2	○2· 1·	4· ○	·3
3	4· ·2	○	·1 3·
4	4· ·1	○	3··2
5	4· 3·	○	1· 2·
6	4· 3· 2· ·1	○	
7	·4 ·3 ·2 1	○·	
8	·4	○	·2 ·1●·3●
9	·4 1·2	○·	·3
10	·2 ·4	○	·1 3·
11	1·	○	3· ·4 ·2●
12	3·	○	1· 2· ·4
13	3· 2··1	○	·4
14	·3 ·2	○	1· ·4
15		○	·2 4· ·1●·3●
16	1·	○	2· ·3 4·
17	2·	○	·1 3·4·
18	1·	○	4· 3· ·2●
19	3· 4·	○	·12·
20	3· 4· 2· ·1	○	
21	4· ·3 ·2	○	1·
22	4·	○	1 3 ·2
23	○1· 4·	○	2· ·3
24	·4 2·	○	·1 3·
25	·4 1· ·	○	2 3·
26	·4 3·	○	·1 2·
27	3· ·1 2· ·4	○	
28	·3 ·2	○	1· ·4
29	·1 ·3	○	·2 ·4
30	1	○	· 2··3 ·4
31	2·	○	·3 ·4 ·1●

GREENWICH MEAN TIME.

JUNE.

d	h	m	
1	9	31	I. Tr. I.
	10	17	I. Sh. I.
	11	47	I. Tr. E.
	12	33	I. Sh. E.
	17	51	II. Oc. D.
	22	10.0	II. Ec. R.
2	6	52	I. Oc. D.
	9	54.7	I. Ec. R.
	11	41	III. Tr. I.
	14	43	III. Sh. I.
	15	4	III. Tr. E.
	18	10	III. Sh. E.
3	4	1	I. Tr. I.
	4	46	I. Sh. I.
	6	17	I. Tr. E.
	7	2	I. Sh. E.
	13	4	II.*Tr. I.
	14	33	II. Sh. I.
	15	49	II. Tr. E.
	17	20	II. Sh. E.
4	1	22	I. Oc. D.
	4	23.4	I. Ec. R.
	22	31	I. Tr. I.
	23	14	I. Sh. I.
5	0	47	I. Tr. E.
	1	31	I. Sh. E.
	6	3	IV. Tr. I.
	7	15	II. Oc. D.
	9	26	IV. Tr. E.
	11	28.2	II. Ec. R.
	12	35	IV. Sh. I.
	16	20	IV. Sh. E.
	19	52	I. Oc. D.
	22	52.1	I. Ec. R.
6	1	47	III. Oc. D.
	8	5.6	III. Ec. R.
	17	2	I. Tr. I.
	17	43	I. Sh. I.
	19	18	I. Tr. E.
	19	59	I. Sh. E.
7	2	29	II. Tr. I.
	3	51	II. Sh. I.
7	5	14	II. Tr. E.
	6	38	II. Sh. E.
	14	23	I. Oc. D.
	17	20.8	I. Ec. R.
8	11	32	I. Tr. I.
	12	12	I. Sh. I.
	13	48	I.*Tr. E.
	14	28	I. Sh. E.
	20	39	II. Oc. D.
9	0	46.3	II. Ec. R.
	8	53	I. Oc. D.
	11	49.5	I. Ec. R.
	16	6	III. Tr. I.
	18	43	III. Sh. I.
	19	30	III. Tr. E.
	22	11	III. Sh. E.
10	6	2	I. Tr. I.
	6	40	I. Sh. I.
	8	18	I. Tr. E.
	8	57	I. Sh. E.
	15	53	II. Tr. I.
	17	9	II. Sh. I.
	18	38	II. Tr. E.
	19	56	II. Sh. E.
11	3	23	I. Oc. D.
	6	18.3	I. Ec. R.
12	0	32	I. Tr. I.
	1	9	I. Sh. I.
	2	48	I. Tr. E.
	3	26	I. Sh. E.
	10	4	II. Oc. D.
	14	4.6	II. Ec. R.
	21	53	I. Oc. D.
13	0	47.0	I. Ec. R.
	6	11	III. Oc. D.
	12	5.3	III. Ec. R.
	15	58	IV. Oc. D.
	19	2	I. Tr. I.
	19	30	IV. Oc. R.
	19	38	I. Sh. I.
	21	19	I. Tr. E.
	21	32.5	IV. Ec. D.
13	21	54	I. Sh. E.
14	1	24.0	IV. Ec. R.
	5	18	II. Tr. I.
	6	28	II. Sh. I.
	8	3	II. Tr. E.
	9	14	II. Sh. E.
	16	24	I. Oc. D.
	19	15.7	I. Ec. R.
15	13	33	I.*Tr. I.
	14	6	I. Sh. I.
	15	49	I. Tr. E.
	16	23	I. Sh. E.
	23	28	II. Oc. D.
16	3	22.6	II. Ec. R.
	10	54	I. Oc. D.
	13	44.3	I.*Ec. R.
	20	32	III. Tr. I.
	22	43	III. Sh. I.
	23	57	III. Tr. E.
17	2	11	III. Sh. E.
	8	3	I. Tr. I.
	8	35	I. Sh. I.
	10	19	I. Tr. E.
	10	52	I. Sh. E.
	18	42	II. Tr. I.
	19	45	II. Sh. I.
	21	28	II. Tr. E.
	22	32	II. Sh. E.
18	5	24	I. Oc. D.
	8	13.1	I. Ec. R.
19	2	33	I. Tr. I.
	3	4	I. Sh. I.
	4	50	I. Tr. E.
	5	21	I. Sh. E.
	12	53	II. Oc. D.
	16	40.9	II. Ec. R.
	23	55	I. Oc. D.
20	2	41.7	I. Ec. R.
	10	37	III. Oc. D.
	16	4.9	III. Ec. R.
	21	4	I. Tr. I.
20	21	32	I. Sh. I.
	23	20	I. Tr. E.
	23	49	I. Sh. E.
21	8	7	II. Tr. I.
	9	4	II. Sh. I.
	10	53	II. Tr. E.
	11	50	II. Sh. E.
	18	25	I. Oc. D.
	21	10.4	I. Ec. R.
22	2	22	IV. Tr. I.
	5	59	IV. Tr. E.
	6	35	IV. Sh. I.
	10	27	IV. Sh. E.
	15	34	I. Tr. I.
	16	1	I. Sh. I.
	17	50	I. Tr. E.
	18	18	I. Sh. E.
23	2	17	II. Oc. D.
	5	59.0	II. Ec. R.
	12	55	I. Oc. D.
	15	39.0	I. Ec. R.
24	0	58	III. Tr. I.
	2	42	III. Sh. I.
	4	24	III. Tr. E.
	6	11	III. Sh. E.
	10	4	I. Tr. I.
	10	30	I. Sh. I.
	12	21	I. Tr. E.
	12	47	I. Sh. E.
	21	31	II. Tr. I.
	22	21	II. Sh. I.
25	0	17	II. Tr. E.
	1	8	II. Sh. E.
	7	26	I. Oc. D.
	10	7.7	I. Ec. R.
26	4	35	I. Tr. I.
	4	58	I. Sh. I.
	6	51	I. Tr. E.
	7	15	I. Sh. E.
	15	42	II. Oc. D.
	19	17.4	II. Ec. R.

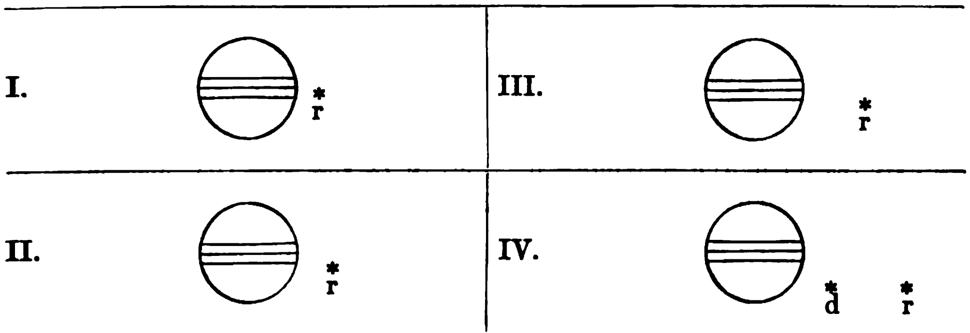
By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given from June 27 to August 11.

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; *Tr., transit of the satellite*; Sh., transit of the shadow. *Visible at Washington.

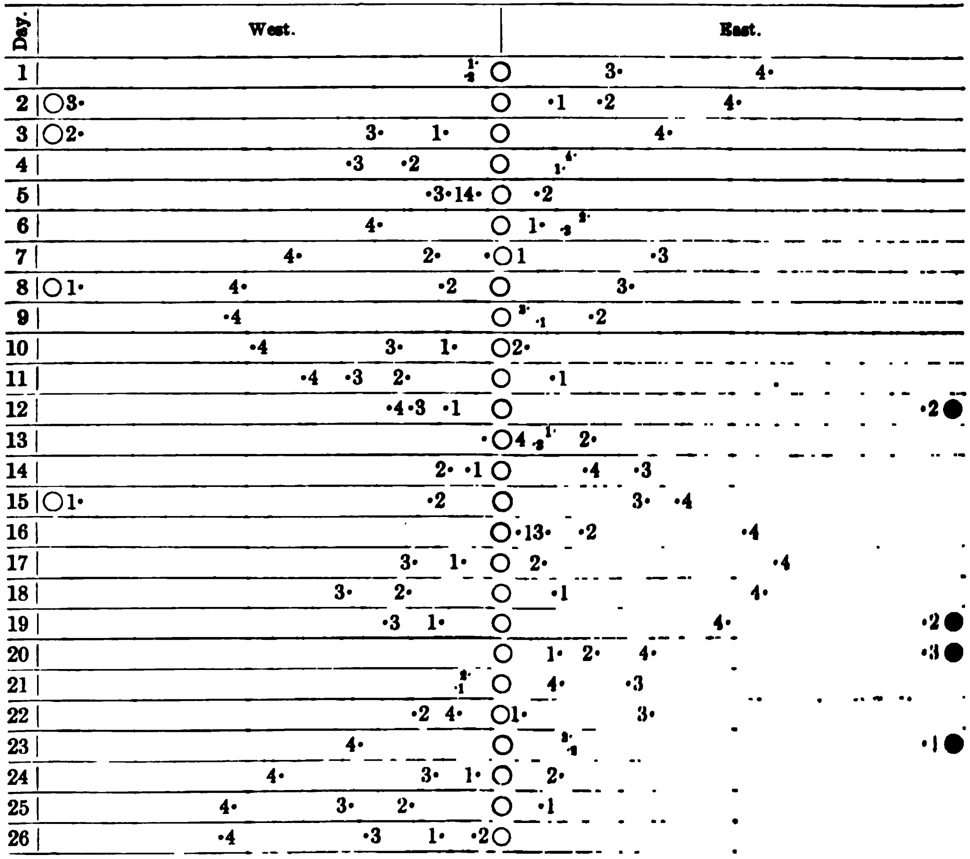
GREENWICH MEAN TIME.

JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 13h 45m for an Inverting Telescope.



GREENWICH MEAN TIME.

AUGUST.

By reason of the proximity of JUPITER to the SUN the phenomena the satellites are not given from June 27 to August 11.

d	h	m	
12	23	51	I. Sh. I.
13	0	14	I. Tr. I.
	2	9	I. Sh. E.
	2	32	I. Tr. E.
	6	35	III. Sh. I.
	8	10	III. Tr. I.
	10	8	III. Sh. E.
	11	44	III. Tr. E.
	16	26	II. Sh. I.
	17	13	II. Tr. I.
	19	13	II. Sh. E.
	20	1	II. Tr. E.
	21	9.8	I. Ec. D.
	23	51	I. Oc. R.
14	18	20	I. Sh. I.
	18	44	I. Tr. I.
	20	37	I. Sh. E.
	21	2	I. Tr. E.
15	10	43.6	II. Ec. D.
	14	27	II. Oc. R.
	15	38.2	I. Ec. D.
	18	21	I. Oc. R.
16	12	48	I. Sh. I.
	13	15	I. Tr. I.
	15	6	I. Sh. E.
	15	33	I. Tr. E.
	20	26.5	III. Ec. D.
17	1	51	III. Oc. R.
	5	43	II. Sh. I.
	6	36	II. Tr. I.
	8	30	II. Sh. E.
	9	24	II. Tr. E.
	10	6.7	I. Ec. D.
	12	51	I. Oc. R.
18	7	17	I. Sh. I.
18	7	45	I. Tr. I.
	9	34	I. Sh. E.
	10	3	I. Tr. E.
19	0	1.4	II. Ec. D.
	3	51	II. Oc. R.
	4	35.1	I. Ec. D.
	7	21	I. Oc. R.
	21	38.8	IV.*Ec. D.
20	1	45	I. Sh. I.
	1	54.8	IV. Ec. R.
	2	15	I. Tr. I.
	2	25	IV. Oc. D.
	4	3	I. Sh. E.
	4	33	I. Tr. E.
	6	46	IV. Oc. R.
	10	34	III. Sh. I.
	12	36	III. Tr. I.
	14	8	III. Sh. E.
	16	11	III. Tr. E.
	19	0	II. Sh. I.
	20	0	II. Tr. I.
	21	47	II.*Sh. E.
	22	48	II. Tr. E.
	23	3.5	I. Ec. D.
21	1	51	I. Oc. R.
	20	14	I. Sh. I.
	20	45	I. Tr. I.
	22	32	I. Sh. E.
	23	3	I. Tr. E.
22	13	20.0	II. Ec. D.
	17	17	II. Oc. R.
	17	31.9	I. Ec. D.
	20	21	I. Oc. R.
23	14	43	I. Sh. I.
	15	16	I. Tr. I.
	17	0	I. Sh. E.
23	17	34	I. Tr. E.
24	0	25.1	III. Ec. D.
	6	17	III. Oc. R.
	8	17	II. Sh. I.
	9	23	II. Tr. I.
	11	4	II. Sh. E.
	12	0.3	I. Ec. D.
	12	11	II. Tr. E.
	14	51	I. Oc. R.
25	9	11	I. Sh. I.
	9	46	I. Tr. I.
	11	29	I. Sh. E.
	12	4	I. Tr. E.
26	2	37.9	II. Ec. D.
	6	28.7	I. Ec. D.
	6	42	II. Oc. R.
	9	21	I. Oc. R.
27	3	40	I. Sh. I.
	4	16	I. Tr. I.
	5	57	I. Sh. E.
	6	34	I. Tr. E.
	14	33	III. Sh. I.
	17	1	III. Tr. I.
	18	6	III. Sh. E.
	20	37	III. Tr. E.
	21	34	II.*Sh. I.
	22	46	II. Tr. I.
28	0	21	II. Sh. E.
	0	57.1	I. Ec. D.
	1	35	II. Tr. E.
	3	51	I. Oc. R.
	6	32	IV. Sh. I.
	10	46	IV. Sh. E.
	12	19	IV. Tr. I.
	16	40	IV. Tr. E.
	22	8	I. Sh. I.
28	22	46	I. Tr. I
29	0	26	I. Sh. E
	1	4	I. Tr. E
	15	56.5	II. Ec. D
	19	25.5	I. Ec. D
	20	7	II. Oc. R
	22	21	I. Oc. R
30	16	37	I. Sh. I
	17	16	I. Tr. I
	18	54	I. Sh. E
	19	34	I. Tr. E
31	4	24.1	III. Ec. D
	10	43	III. Oc. R
	10	51	II. Sh. I
	12	9	II. Tr. I
	13	38	II. Sh. E
	13	53.9	I. Ec. D
	14	58	II. Tr. E
	16	51	I. Oc. R

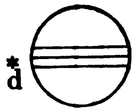
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultatio Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

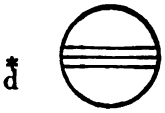
AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

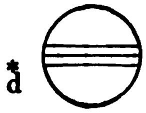
I.



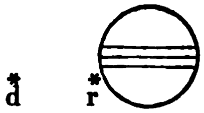
III.



II.



IV.



Configurations at 21h 30m for an Inverting Telescope.

Day.	West.		East.
1		○	
2		○	
3		○	
4		○	
5		○	
6		○	
7		○	
8		○	
9		○	
10		○	
11		○	
12		○	
13	4• 3• 2•	○	•1 ●
14	4• 3• •2 1•	○	
15	4• •3	○	•1•2
16	•4 1•	○	2• •3 ●
17	•4 2•	○	•1 •3
18	•4 •1 •2	○	3•
19	•4	○	1• 3• •2
20	○2• 3• •1	○	•4
21	○1• 3• •2	○	•4
22	•3	○	•1•2 •4
23	1• •3	○	2• •4
24	2•	○	•1 •3 4•
25	1• •2	○	•3 4•
26		○	1• •2 3• 4•
27	•13•	○	2• 4•
28	3• •2 4•	○	1•
29	•3 4•	○	•2 •1 ●
30	4• •3 1•	○	2•
31	4• 2•	○	•1 •3

GREENWICH MEAN TIME.

SEPTEMBER.

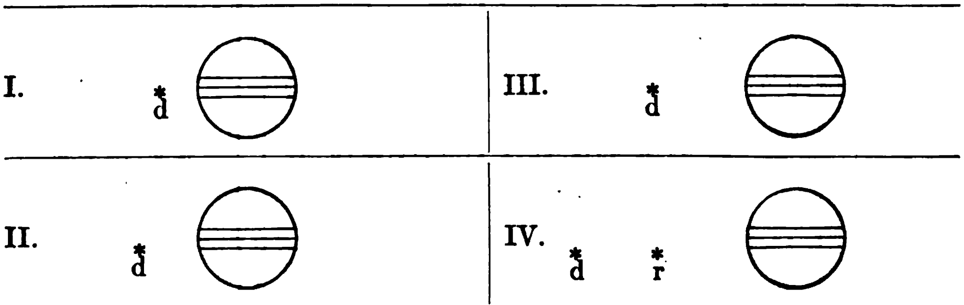
d	h	m	
1	11	5	I. Sh. I.
	11	46	I. Tr. I.
	13	23	I. Sh. E.
	14	4	I. Tr. E.
2	5	14.3	II. Ec. D.
	8	22.2	I. Ec. D.
	9	32	II. Oc. R.
	11	21	I. Oc. R.
3	5	34	I. Sh. I.
	6	16	I. Tr. I.
	7	51	I. Sh. E.
	8	34	I. Tr. E.
	18	31	III. Sh. I.
	21	25	III.*Tr. I.
	22	5	III.*Sh. E.
4	0	8	II. Sh. I.
	1	1	III. Tr. E.
	1	32	II. Tr. I.
	2	50.6	I. Ec. D.
	2	55	II. Sh. E.
	4	21	II. Tr. E.
	5	51	I. Oc. R.
5	0	3	I. Sh. I.
	0	46	I. Tr. I.
	2	20	I. Sh. E.
	3	4	I. Tr. E.
	15	39.0	IV. Ec. D.
	18	32.9	II. Ec. D.
	19	59.9	IV. Ec. R.
	21	19.0	I.*Ec. D.
	22	47	IV. Oc. D.
	22	57	II. Oc. R.
6	0	21	I. Oc. R.
	3	18	IV. Oc. R.
	18	31	I. Sh. I.
	19	16	I. Tr. I.
	20	49	I.*Sh. E.
	21	34	I.*Tr. E.
7	8	22.3	III. Ec. D.
	13	25	II. Sh. I.
	14	55	II. Tr. I.
	15	6	III. Oc. R.
	15	47.3	I. Ec. D.
	16	12	II. Sh. E.
	17	43	II. Tr. E.
	18	51	I. Oc. R.
8	13	0	I. Sh. I.
	13	46	I. Tr. I.
	15	17	I. Sh. E.
	16	4	I. Tr. E.
9	7	50.7	II. Ec. D.
	10	15.7	I. Ec. D.
	12	21	II. Oc. R.
9	13	20	I. Oc. R.
10	7	28	I. Sh. I.
	8	16	I. Tr. I.
	9	46	I. Sh. E.
	10	34	I. Tr. E.
	22	30	III. Sh. I.
11	1	48	III. Tr. I.
	2	5	III. Sh. E.
	2	41	II. Sh. I.
	4	17	II. Tr. I.
	4	44.0	I. Ec. D.
	5	24	III. Tr. E.
	5	29	II. Sh. E.
	7	6	II. Tr. E.
	7	50	I. Oc. R.
12	1	57	I. Sh. I.
	2	46	I. Tr. I.
	4	14	I. Sh. E.
	5	4	I. Tr. E.
	21	9.4	II.*Ec. D.
	23	12.4	I. Ec. D.
13	1	45	II. Oc. R.
	2	20	I. Oc. R.
	20	25	I.*Sh. I.
	21	16	I.*Tr. I.
	22	43	I. Sh. E.
	23	34	I. Tr. E.
14	0	30	IV. Sh. I.
	4	48	IV. Sh. E.
	8	27	IV. Tr. I.
	12	20.2	III. Ec. D.
	12	56	IV. Tr. E.
	15	58	II. Sh. I.
	17	39	II. Tr. I.
	17	40.7	I. Ec. D.
	18	46	II. Sh. E.
	19	28	III. Oc. R.
	20	28	II.*Tr. E.
	20	50	I.*Oc. R.
15	14	54	I. Sh. I.
	15	46	I. Tr. I.
	17	11	I. Sh. E.
	18	4	I. Tr. E.
16	10	27.1	II. Ec. D.
	12	9.0	I. Ec. D.
	15	9	II. Oc. R.
	15	19	I. Oc. R.
17	9	22	I. Sh. I.
	10	16	I. Tr. I.
	11	40	I. Sh. E.
	12	34	I. Tr. E.
18	2	29	III. Sh. I.
18	5	15	II. Sh. I.
	6	3	III. Sh. E.
	6	9	III. Tr. I.
	6	37.4	I. Ec. D.
	7	1	II. Tr. I.
	8	2	II. Sh. E.
	9	45	III. Tr. E.
	9	49	I. Oc. R.
	9	50	II. Tr. E.
19	3	51	I. Sh. I.
	4	46	I. Tr. I.
	6	8	I. Sh. E.
	7	3	I. Tr. E.
	23	45.8	II. Ec. D.
20	1	5.7	I. Ec. D.
	4	19	I. Oc. R.
	4	33	II. Oc. R.
	22	19	I.*Sh. I.
	23	16	I. Tr. I.
21	0	37	I. Sh. E.
	1	33	I. Tr. E.
	16	17.8	III. Ec. D.
	18	32	II. Sh. I.
	19	34.0	I.*Ec. D.
	19	53.8	III.*Ec. R.
	20	9	III.*Oc. D.
	20	23	II.*Tr. I.
	21	19	II.*Sh. E.
	22	48	I. Oc. R.
	23	12	II. Tr. E.
	23	47	III. Oc. R.
22	9	39.5	IV. Ec. D.
	14	5.1	IV. Ec. R.
	16	48	I. Sh. I.
	17	45	I. Tr. I.
	18	51	IV. Oc. D.
	19	5	I. Sh. E.
	20	3	I.*Tr. E.
	23	29	IV. Oc. R.
23	13	3.5	II. Ec. D.
	14	2.3	I. Ec. D.
	17	18	I. Oc. R.
	17	56	II. Oc. R.
24	11	16	I. Sh. I.
	12	15	I. Tr. I.
	13	34	I. Sh. E.
	14	33	I. Tr. E.
25	6	28	III. Sh. I.
	7	48	II. Sh. I.
	8	30.6	I. Ec. D.
	9	45	II. Tr. I.
	10	3	III. Sh. E.
	10	28	III. Tr. I.
	10	36	II. Sh. E.
25	11	47	I. Oc
	12	33	II. Tr
	14	5	III. Tr
26	5	45	I. Sh
	6	45	I. Tr
	8	2	I. Sh
	9	2	I. Tr
27	2	22.1	II. Ec
	2	58.9	I. Ec
	6	17	I. Oc
	7	20	II. Oc
28	0	13	I. Sh
	1	14	I. Tr
	2	31	I. Sh
	3	32	I. Tr
	20	15.4	III.*Ec
	21	5	II.*Sh
	21	27.2	I.*Ec
	23	6	II. Tr
	23	51.8	III. Ec
	23	53	II. Sh
29	0	26	III. Oc
	0	46	I. Oc
	1	55	II. Tr
	4	5	III. Oc
	18	42	I. Sh
	19	44	I.*Tr
	20	59	I.*Sh
	22	1	I.*Tr
30	15	39.8	II. Ec
	15	55.5	I. Ec
	18	28	IV. Sh
	19	15	I.*Oc
	20	42	II.*Oc
	22	49	IV. Sh

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occult *Tr., transit of the satellite*; Sh., transit of the shadow. *Visible at Washington.

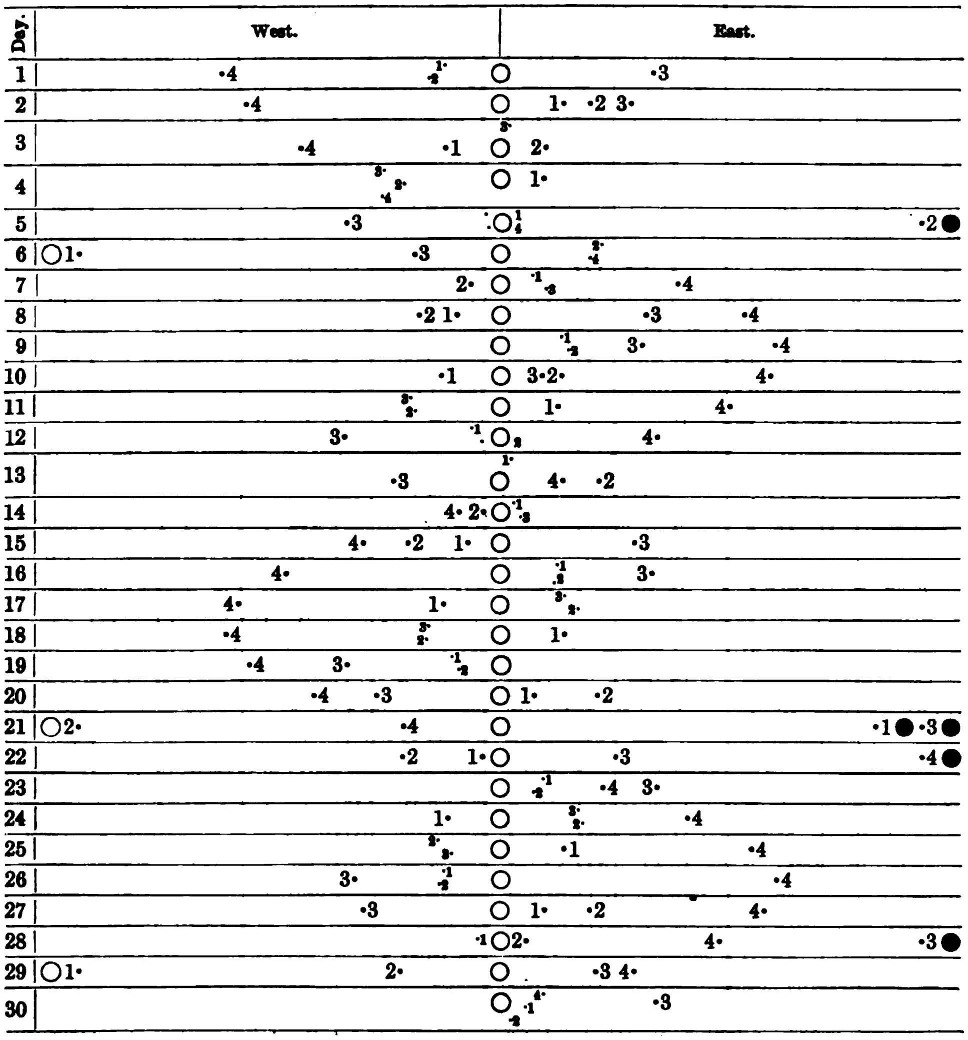
GREENWICH MEAN TIME.

SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 21ʰ 0ᵐ for an Inverting Telescope.



GREENWICH MEAN TIME.

OCTOBER.

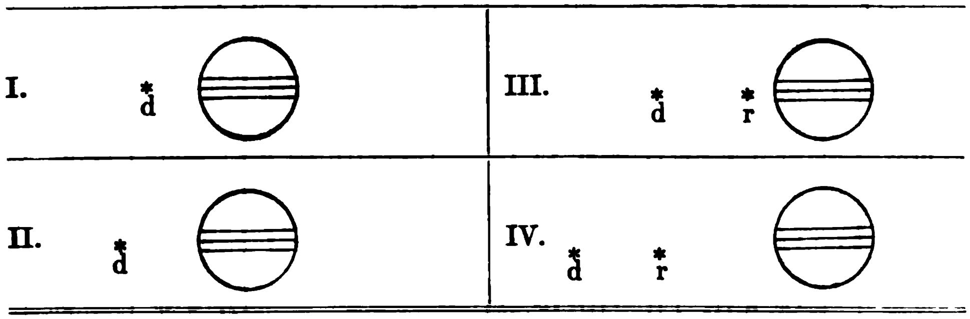
d h m		d h m		d h m		d h m	
1 4 13	IV. Tr. I.	9 14 25	III. Sh. I.	17 11 26	I. Sh. I.	25 14 3	I. Oc. R.
8 47	IV. Tr. E.	14 28	IV. Oc. D.	12 26	IV. Sh. I.	18 12	II.*Oc. R.
13 10	I. Sh. I.	15 7	II. Tr. I.	12 38	I. Tr. I.	21 38.1	IV.*Ec. D.
14 13	I. Tr. I.	15 42	I. Oc. R.	13 43	I. Sh. E.		
15 28	I. Sh. E.	15 42	II. Sh. E.	14 55	I. Tr. E.	26 2 12.1	IV. Ec. R.
16 31	I. Tr. E.	17 56	II. Tr. E.	16 51	IV. Sh. E.	7 49	I. Sh. I.
		18 0	III. Sh. E.	23 28	IV. Tr. I.	9 3	I. Tr. I.
2 10 22	II. Sh. I.	18 59	III.*Tr. I.			9 28	IV. Oc. D.
10 23.8	I. Ec. D.	19 11	IV.*Oc. R.	18 4 7	IV. Tr. E.	10 6	I. Sh. E.
10 27	III. Sh. I.	22 36	III.*Tr. E.	8 38.3	I. Ec. D.	11 20	I. Tr. E.
12 27	II. Tr. I.			10 10.8	II. Ec. D.	14 16	IV. Oc. R.
13 9	II. Sh. E.	10 9 33	I. Sh. I.	12 7	I. Oc. R.		
13 45	I. Oc. R.	10 41	I. Tr. I.	15 31	II. Oc. R.	27 4 59.6	I. Ec. D.
14 1	III. Sh. E.	11 50	I. Sh. E.			7 18	II. Sh. I.
14 45	III. Tr. I.	12 58	I. Tr. E.	19 5 55	I. Sh. I.	8 31	I. Oc. R.
15 16	II. Tr. E.			7 7	I. Tr. I.	9 43	II. Tr. I.
18 22	III. Tr. E.	11 6 45.2	I. Ec. D.	8 12	I. Sh. E.	10 6	II. Sh. E.
		7 34.6	II. Ec. D.	9 24	I. Tr. E.	12 8.1	III. Ec. D.
3 7 39	I. Sh. I.	10 11	I. Oc. R.			12 33	II. Tr. E.
8 43	I. Tr. I.	12 49	II. Oc. R.	20 3 6.6	I. Ec. D.	15 45.7	III. Ec. R.
9 56	I. Sh. E.			4 45	II. Sh. I.	17 11	III. Oc. D.
11 0	I. Tr. E.	12 4 1	I. Sh. I.	6 36	I. Oc. R.	20 50	III.*Oc. R.
		5 10	I. Tr. I.	7 6	II. Tr. I.		
4 4 52.1	I. Ec. D.	6 18	I. Sh. E.	7 32	II. Sh. E.	28 2 17	I. Sh. I.
4 58.4	II. Ec. D.	7 27	I. Tr. E.	8 10.3	III. Ec. D.	3 31	I. Tr. I.
8 14	I. Oc. R.			9 55	II. Tr. E.	4 34	I. Sh. E.
10 5	II. Oc. R.	13 1 13.5	I. Ec. D.	11 47.7	III. Ec. R.	5 49	I. Tr. E.
		2 12	II. Sh. I.	13 5	III. Oc. D.	23 27.8	I. Ec. D.
5 2 7	I. Sh. I.	4 11.8	III. Ec. D.	16 44	III. Oc. R.		
3 12	I. Tr. I.	4 27	II. Tr. I.			29 2 4.4	II. Ec. D.
4 24	I. Sh. E.	4 40	I. Oc. R.	21 0 23	I. Sh. I.	3 0	I. Oc. R.
5 30	I. Tr. E.	4 59	II. Sh. E.	1 36	I. Tr. I.	7 31	II. Oc. R.
23 20.4	I. Ec. D.	7 17	II. Tr. E.	2 40	I. Sh. E.	20 46	I.*Sh. I.
23 38	II. Sh. I.	7 48.8	III. Ec. R.	3 53	I. Tr. E.	22 0	I.*Tr. I.
		8 54	III. Oc. D.	21 34.8	I.*Ec. D.	23 3	I. Sh. E.
6 0 13.7	III. Ec. D.	12 34	III. Oc. R.	23 28.4	II. Ec. D.		
1 47	II. Tr. I.	22 30	I.*Sh. I.			30 0 17	I. Tr. E.
2 26	II. Sh. E.	23 39	I. Tr. I.	22 1 5	I. Oc. R.	17 56.1	I.*Ec. D.
2 43	I. Oc. R.			4 52	II. Oc. R.	20 34	II.*Sh. I.
3 50.4	III. Ec. R.	14 0 47	I. Sh. E.	18 52	I.*Sh. I.	21 29	I.*Oc. R.
4 36	II. Tr. E.	1 57	I. Tr. E.	20 5	I.*Tr. I.	23 1	II.*Tr. I.
4 42	III. Oc. D.	19 41.7	I.*Ec. D.	21 9	I.*Sh. E.	23 22	II. Sh. E.
8 21	III. Oc. R.	20 52.2	II.*Ec. D.	22 22	I.*Tr. E.		
20 36	I.*Sh. I.	23 9	I. Oc. R.			31 1 51	II. Tr. E.
21 42	I.*Tr. I.			23 16 3.1	I. Ec. D.	2 20	III. Sh. I.
22 53	I. Sh. E.	15 2 10	II. Oc. R.	18 1	II.*Sh. I.	5 55	III. Sh. E.
23 59	I. Tr. E.	16 58	I. Sh. I.	19 34	I.*Oc. R.	7 23	III. Tr. I.
		18 8	I. Tr. I.	20 25	II.*Tr. I.	11 0	III. Tr. E.
7 17 48.6	I. Ec. D.	19 15	I.*Sh. E.	20 49	II.*Sh. E.	15 14	I. Sh. I.
18 16.1	II. Ec. D.	20 26	I.*Tr. E.	22 21	III.*Sh. I.	16 29	I. Tr. I.
21 13	I.*Oc. R.			23 14	II. Tr. E.	17 31	I.*Sh. E.
23 27	II. Oc. R.	16 14 10.0	I. Ec. D.			18 46	I.*Tr. E.
		15 28	II. Sh. I.	24 1 56	III. Sh. E.		
8 15 4	I. Sh. I.	17 38	I. Oc. R.	3 18	III. Tr. I.		
16 11	I. Tr. I.	17 47	II. Tr. I.	6 55	III. Tr. E.		
17 21	I. Sh. E.	18 16	II.*Sh. E.	13 20	I. Sh. I.		
18 29	I. Tr. E.	18 23	III.*Sh. I.	14 34	I. Tr. I.		
		20 36	II.*Tr. E.	15 37	I. Sh. E.		
9 3 38.9	IV. Ec. D.	21 58	III.*Sh. E.	16 51	I. Tr. E.		
8 9.0	IV. Ec. R.	23 10	III. Tr. I.				
12 16.9	I. Ec. D.			25 10 31.3	I. Ec. D.		
12 55	II. Sh. I.	17 2 47	III. Tr. E.	12 46.8	II. Ec. D.		

Note.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

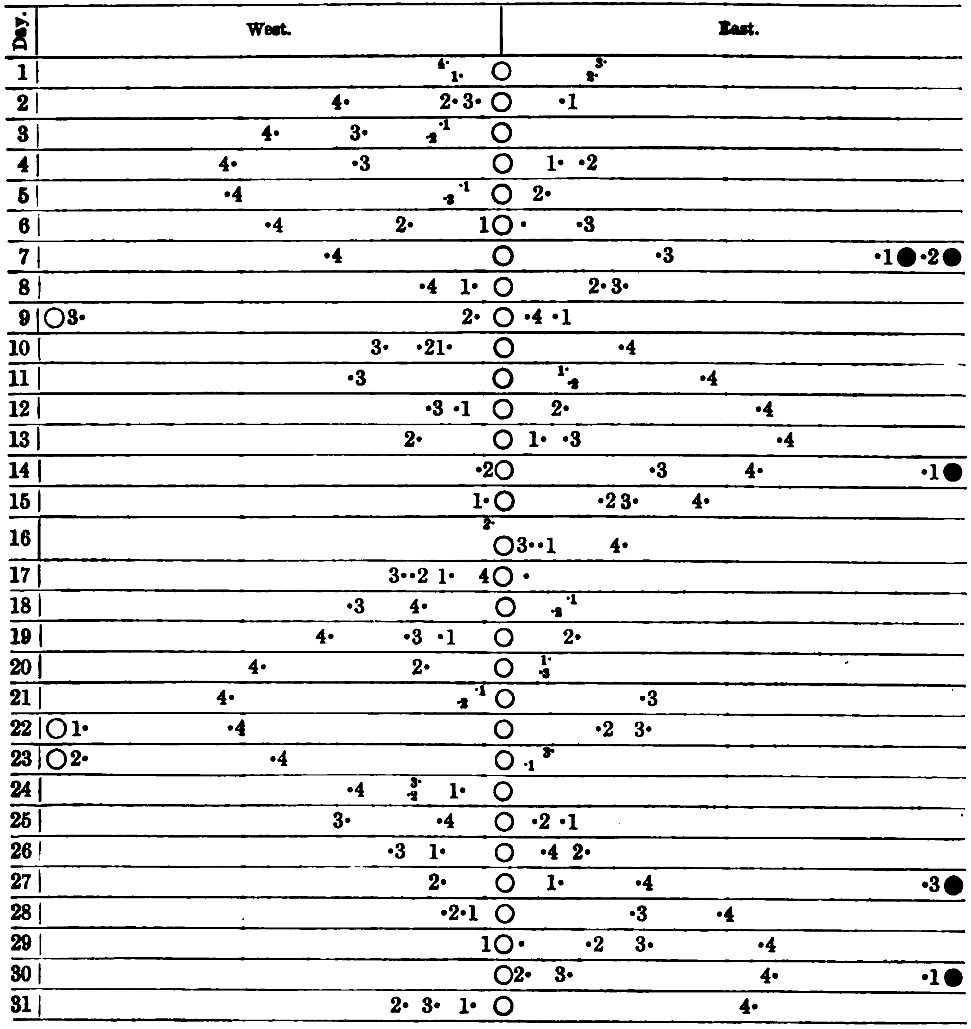
GREENWICH MEAN TIME.

OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 20ʰ 45ᵐ for an Inverting Telescope.



GREENWICH MEAN TIME.

NOVEMBER.

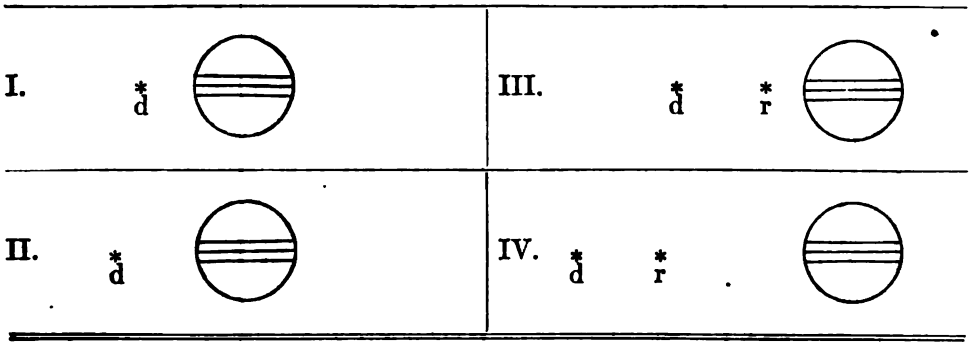
d	h	m	
1	12	24.4	I. Ec. D.
	15	22.8	II. Ec. D.
	15	57	I. Oc. R.
	20	51	II.*Oc. R.
2	9	42	I. Sh. I.
	10	58	I. Tr. I.
	11	59	I. Sh. E.
	13	15	I. Tr. E.
3	6	23	IV. Sh. I.
	6	52.6	I. Ec. D.
	9	51	II. Sh. I.
	10	26	I. Oc. R.
	10	51	IV. Sh. E.
	12	19	II. Tr. I.
	12	39	II. Sh. E.
	15	9	II. Tr. E.
	16	5.6	III. Ec. D.
	18	4	IV.*Tr. I.
	19	43.4	III.*Ec. R.
	21	13	III.*Oc. D.
	22	45	IV.*Tr. E.
4	0	53	III. Oc. R.
	4	11	I. Sh. I.
	5	26	I. Tr. I.
	6	28	I. Sh. E.
	7	43	I. Tr. E.
5	1	20.8	I. Ec. D.
	4	40.3	II. Ec. D.
	4	54	I. Oc. R.
	10	9	II. Oc. R.
	22	39	I.*Sh. I.
	23	55	I. Tr. I.
6	0	56	I. Sh. E.
	2	12	I. Tr. E.
	19	49.1	I.*Ec. D.
	23	8	II.*Sh. I.
	23	22	I. Oc. R.
7	1	36	II. Tr. I.
	1	56	II. Sh. E.
	4	26	II. Tr. E.
	6	18	III. Sh. I.
	9	53	III. Sh. E.
	11	24	III. Tr. I.
	15	1	III. Tr. E.
	17	8	I.*Sh. I.
	18	23	I.*Tr. I.
	19	25	I.*Sh. E.
	20	40	I.*Tr. E.
8	14	17.4	I. Ec. D.
	17	51	I.*Oc. R.
	17	58.7	II.*Ec. D.
	23	28	II. Oc. R.
9	11	36	I. Sh. I.
9	12	52	I. Tr. I.
	13	53	I. Sh. E.
	15	9	I. Tr. E.
10	8	45.6	I. Ec. D.
	12	19	I. Oc. R.
	12	24	II. Sh. I.
	14	53	II. Tr. I.
	15	12	II. Sh. E.
	17	43	II.*Tr. E.
	20	2.9	III.*Ec. D.
	23	41.0	III. Ec. R.
11	1	11	III. Oc. D.
	4	51	III. Oc. R.
	6	4	I. Sh. I.
	7	20	I. Tr. I.
	8	21	I. Sh. E.
	9	37	I. Tr. E.
	15	38.0	IV. Ec. D.
	20	15.3	IV.*Ec. R.
12	3	13.9	I. Ec. D.
	3	44	IV. Oc. D.
	6	47	I. Oc. R.
	7	16.1	II. Ec. D.
	8	34	IV. Oc. R.
	12	45	II. Oc. R.
13	0	33	I. Sh. I.
	1	48	I. Tr. I.
	2	50	I. Sh. E.
	4	5	I. Tr. E.
	21	42.1	I.*Ec. D.
14	1	15	I. Oc. R.
	1	41	II. Sh. I.
	4	9	II. Tr. I.
	4	29	II. Sh. E.
	6	59	II. Tr. E.
	10	16	III. Sh. I.
	13	52	III. Sh. E.
	15	21	III. Tr. I.
	18	58	III.*Tr. E.
	19	1	I.*Sh. I.
	20	16	I.*Tr. I.
	21	18	I.*Sh. E.
	22	33	I.*Tr. E.
15	16	10.5	I. Ec. D.
	19	43	I.*Oc. R.
	20	34.4	II.*Ec. D.
16	2	2	II. Oc. R.
	13	30	I. Sh. I.
	14	45	I. Tr. I.
	15	47	I. Sh. E.
	17	2	I.*Tr. E.
17	10	38.7	I. Ec. D.
	14	11	I. Oc. R.
17	14	57	II. Sh. I.
	17	25	II.*Tr. I.
	17	46	II.*Sh. E.
	20	15	II.*Tr. E.
18	0	0.3	III. Ec. D.
	3	38.7	III. Ec. R.
	5	5	III. Oc. D.
	7	58	I. Sh. I.
	8	45	III. Oc. R.
	9	13	I. Tr. I.
	10	15	I. Sh. E.
	11	30	I. Tr. E.
19	5	6.9	I. Ec. D.
	8	39	I. Oc. R.
	9	51.9	II. Ec. D.
	15	18	II. Oc. R.
20	0	19	IV. Sh. I.
	2	26	I. Sh. I.
	3	41	I. Tr. I.
	4	43	I. Sh. E.
	4	51	IV. Sh. E.
	5	58	I. Tr. E.
	11	50	IV. Tr. I.
	16	33	IV.*Tr. E.
	23	35.2	I. Ec. D.
21	3	7	I. Oc. R.
	4	14	II. Sh. I.
	6	40	II. Tr. I.
	7	3	II. Sh. E.
	9	30	II. Tr. E.
	14	14	III. Sh. I.
	17	50	III.*Sh. E.
	19	14	III.*Tr. I.
	20	55	I.*Sh. I.
	22	9	I.*Tr. I.
	22	50	III.*Tr. E.
	23	12	I.*Sh. E.
22	0	26	I. Tr. E.
	18	3.5	I.*Ec. D.
	21	35	I.*Oc. R.
	23	10.1	II.*Ec. D.
23	4	34	II. Oc. R.
	15	23	I. Sh. I.
	16	36	I.*Tr. I.
	17	40	I.*Sh. E.
	18	53	I.*Tr. E.
24	12	31.7	I. Ec. D.
	16	3	I.*Oc. R.
	17	31	II.*Sh. I.
	19	54	II.*Tr. I.
	20	19	II.*Sh. E.
	22	45	II.*Tr. E.
25	3	58.5	III. Ec. D.
25	7	37.1	III. Ec. R.
	8	56	III. Oc. D.
	9	52	I. Sh. I.
	11	4	I. Tr. I.
	12	9	I. Sh. E.
	12	36	III. Oc. R.
	13	21	I. Tr. E.
26	7	0.0	I. Ec. D.
	10	30	I. Oc. R.
	12	27.6	II. Ec. D.
	17	49	II.*Oc. R.
27	4	20	I. Sh. I.
	5	32	I. Tr. I.
	6	37	I. Sh. E.
	7	49	I. Tr. E.
28	1	28.2	I. Ec. D.
	4	58	I. Oc. R.
	6	47	II. Sh. I.
	9	9	II. Tr. I.
	9	36	II. Sh. E.
	9	36.9	IV. Ec. D.
	11	59	II. Tr. E.
	14	17.6	IV. Ec. R.
	18	12	III.*Sh. I.
	21	4	IV.*Oc. D.
	21	48	III.*Sh. E.
	22	48	I.*Sh. I.
	23	1	III.*Tr. I.
29	0	0	I. Tr. I.
	1	5	I. Sh. E.
	1	55	IV. Oc. R.
	2	17	I. Tr. E.
	2	38	III. Tr. E.
	19	56.6	I.*Ec. D.
	23	26	I.*Oc. R.
30	1	45.7	II. Ec. D.
	7	4	II. Oc. R.
	17	17	I.*Sh. I.
	18	27	I.*Tr. I.
	19	34	I.*Sh. E.
	20	44	I.*Tr. E.

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

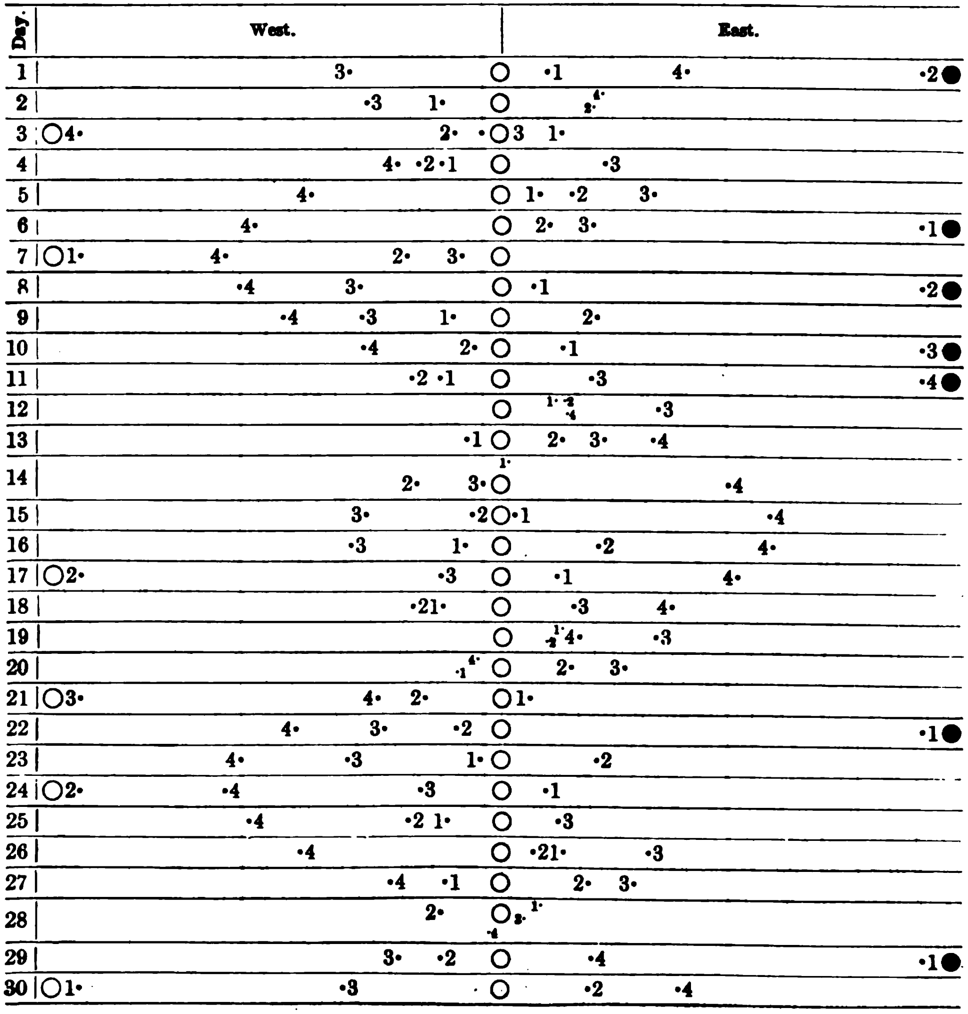
GREENWICH MEAN TIME.

NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 20ʰ 15ᵐ for an Inverting Telescope.



GREENWICH MEAN TIME.

DECEMBER.

d	h	m	
1	14	24.8	I. Ec. D.
	17	53	I.*Oc. R.
	20	4	II.*Sh. I.
	22	22	II.*Tr. I.
	22	53	II.*Sh. E.
2	1	13	II. Tr. E.
	7	56.6	III. Ec. D.
	11	35.4	III. Ec. R.
	11	45	I. Sh. I.
	12	42	III. Oc. D.
	12	55	I. Tr. I.
	14	2	I. Sh. E.
	15	12	I. Tr. E.
	16	21	III.*Oc. R.
3	8	53.1	I. Ec. D.
	12	20	I. Oc. R.
	15	3.1	II. Ec. D.
	20	18	II.*Oc. R.
4	6	13	I. Sh. I.
	7	22	I. Tr. I.
	8	31	I. Sh. E.
	9	39	I. Tr. E.
5	3	21.4	I. Ec. D.
	6	48	I. Oc. R.
	9	21	II. Sh. I.
	11	35	II. Tr. I.
	12	10	II. Sh. E.
	14	26	II. Tr. E.
	22	10	III.*Sh. I.
6	0	42	I. Sh. I.
	1	46	III. Sh. E.
	1	49	I. Tr. I.
	2	45	III. Tr. I.
	2	59	I. Sh. E.
	4	7	I. Tr. E.
	6	21	III. Tr. E.
	18	16	IV.*Sh. I.
	21	49.7	I.*Ec. D.
	22	51	IV.*Sh. E.
7	1	15	I. Oc. R.
	4	21.2	II. Ec. D.
	4	42	IV. Tr. I.
	9	25	IV. Tr. E.
	9	32	II. Oc. R.
	19	10	I.*Sh. I.
	20	17	I.*Tr. I.
	21	27	I.*Sh. E.
	22	34	I.*Tr. E.
8	16	18.0	I.*Ec. D.
	19	42	I.*Oc. R.
	22	37	II.*Sh. I.
9	0	48	II. Tr. I.
	1	27	II. Sh. E.

d	h	m	
9	3	39	II. Tr. E.
	11	55.2	III. Ec. D.
	13	39	I. Sh. I.
	14	44	I. Tr. I.
	15	34.2	III.*Ec. R.
	15	56	I.*Sh. E.
	16	23	III.*Oc. D.
	17	1	I.*Tr. E.
	20	2	III.*Oc. R.
10	10	46.3	I. Ec. D.
	14	9	I. Oc. R.
	17	38.6	II.*Ec. D.
	22	44	II.*Oc. R.
11	8	7	I. Sh. I.
	9	11	I. Tr. I.
	10	24	I. Sh. E.
	11	28	I. Tr. E.
12	5	14.6	I. Ec. D.
	8	36	I. Oc. R.
	11	54	II. Sh. I.
	14	0	II. Tr. I.
	14	44	II.*Sh. E.
	16	51	II.*Tr. E.
13	2	8	III. Sh. I.
	2	35	I. Sh. I.
	3	38	I. Tr. I.
	4	53	I. Sh. E.
	5	44	III. Sh. E.
	5	55	I. Tr. E.
	6	23	III. Tr. I.
	10	0	III. Tr. E.
	23	42.9	I.*Ec. D.
14	3	3	I. Oc. R.
	6	56.6	II. Ec. D.
	11	57	II. Oc. R.
	21	4	I.*Sh. I.
	22	5	I.*Tr. I.
	23	21	I.*Sh. E.
15	0	23	I. Tr. E.
	3	36.1	IV. Ec. D.
	8	19.5	IV. Ec. R.
	13	25	IV. Oc. D.
	18	11.2	I.*Ec. D.
	18	16	IV.*Oc. R.
	21	30	I.*Oc. R.
16	1	11	II. Sh. I.
	3	11	II. Tr. I.
	4	1	II. Sh. E.
	6	3	II. Tr. E.
	15	32	I.*Sh. I.
	15	53.1	III.*Ec. D.
	16	32	I.*Tr. I.
	17	49	I.*Sh. E.
	18	50	I.*Tr. E,

d	h	m	
16	19	32.3	III.*Ec. R.
	19	59	III.*Oc. D.
	23	38	III.*Oc. R.
17	12	39.6	I. Ec. D.
	15	57	I.*Oc. R.
	20	14.0	II.*Ec. D.
18	1	8	II. Oc. R.
	10	0	I. Sh. I.
	10	59	I. Tr. I.
	12	18	I. Sh. E.
	13	16	I. Tr. E.
19	7	7.9	I. Ec. D.
	10	24	I. Oc. R.
	14	28	II.*Sh. I.
	16	22	II.*Tr. I.
	17	18	II.*Sh. E.
	19	14	II.*Tr. E.
20	4	29	I. Sh. I.
	5	26	I. Tr. I.
	6	6	III. Sh. I.
	6	46	I. Sh. E.
	7	43	I. Tr. E.
	9	43	III. Sh. E.
	9	57	III. Tr. I.
	13	34	III. Tr. E.
21	1	36.3	I. Ec. D.
	4	51	I. Oc. R.
	9	32.0	II. Ec. D.
	14	19	II.*Oc. R.
	22	57	I.*Sh. I.
	23	53	I.*Tr. I.
22	1	15	I. Sh. E.
	2	10	I. Tr. E.
	20	4.6	I.*Ec. D.
	23	17	I.*Oc. R.
23	3	45	II. Sh. I.
	5	33	II. Tr. I.
	6	35	II. Sh. E.
	8	24	II. Tr. E.
	12	12	IV. Sh. I.
	16	50	IV.*Sh. E.
	17	26	I.*Sh. I.
	18	19	I.*Tr. I.
	19	43	I.*Sh. E.
	19	50.9	III.*Ec. D.
	20	33	IV.*Tr. I.
	20	37	I.*Tr. E.
	23	30.1	III.*Ec. R.
	23	30	III.*Oc. D.
24	1	18	IV. Tr. E.
	3	9	III. Oc. R.
	14	32.9	I.*Ec. D.
	17	44	I.*Oc. R.

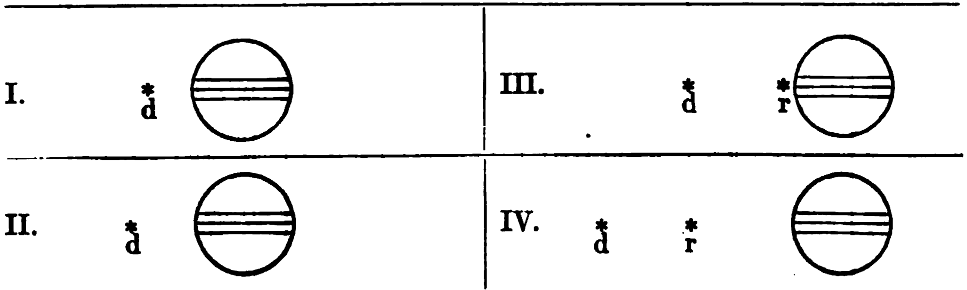
d	h	m	
24	22	49.4	II.*Ec.
25	3	30	II. Oc.
	11	54	I. Sh.
	12	46	I. Tr.
	14	11	I.*Sh.
	15	3	I.*Tr.
26	9	1.3	I. Ec.
	12	11	I. Oc.
	17	2	II.*Sh.
	18	43	II.*Tr.
	19	52	II.*Sh.
	21	34	II.*Tr.
27	6	22	I. Sh.
	7	13	I. Tr.
	8	40	I. Sh.
	9	30	I. Tr.
	10	4	III. Sh.
	13	27	III. Tr.
	13	41	III.*Sh.
	17	4	III.*Tr.
28	3	29.7	I. Ec.
	6	37	I. Oc.
	12	7.3	II. Ec.
	16	40	II.*Oc.
29	0	51	I. Sh.
	1	39	I. Tr.
	3	8	I. Sh.
	3	57	I. Tr.
	21	58.0	I.*Ec.
30	1	4	I. Oc.
	6	18	II. Sh.
	7	52	II. Tr.
	9	9	II. Sh.
	10	44	II. Tr.
	19	19	I.*Sh.
	20	6	I.*Tr.
	21	37	I.*Sh.
	22	23	I.*Tr.
	23	48.6	III.*Ec.
31	6	36	III. Oc.
	16	26.4	I.*Ec.
	19	30	I.*Oc.
	21	36.4	IV.*Ec.

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occulta
Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

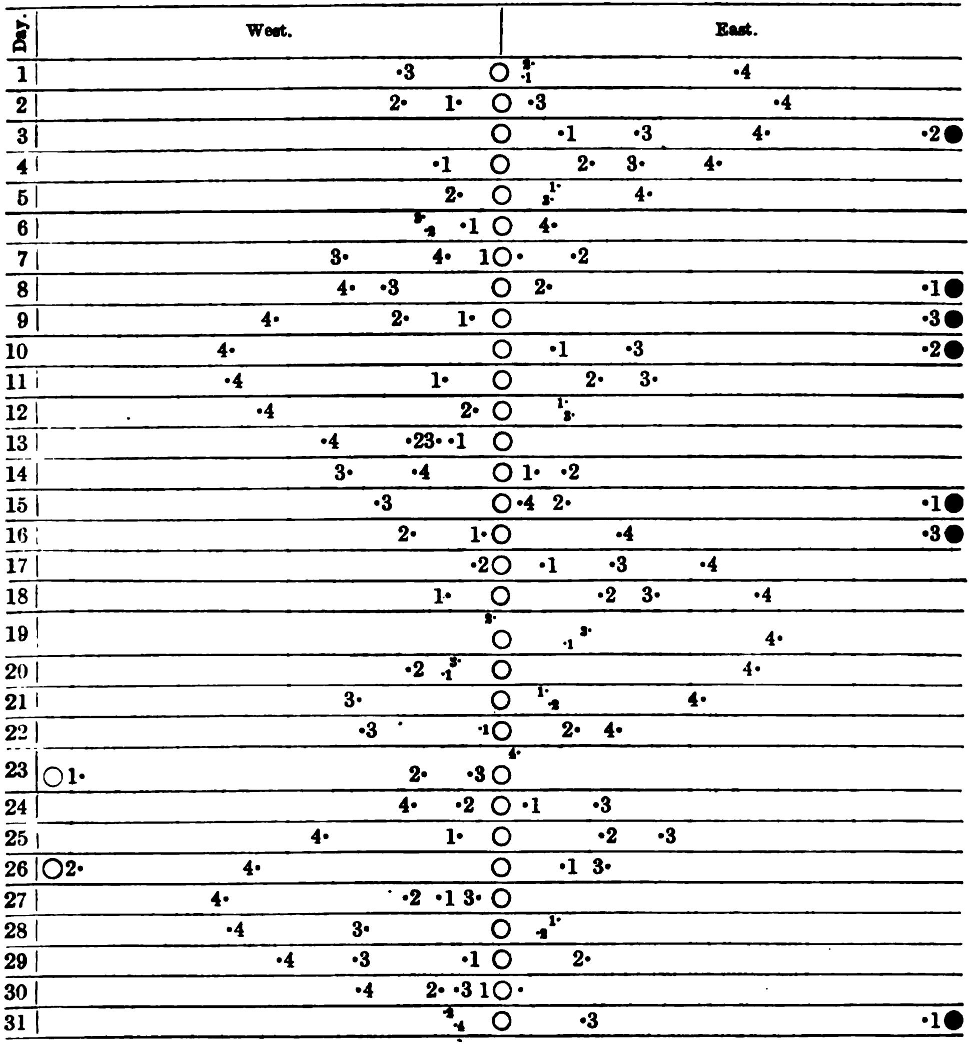
GREENWICH MEAN TIME.

DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 19ʰ 30ᵐ for an Inverting Telescope.



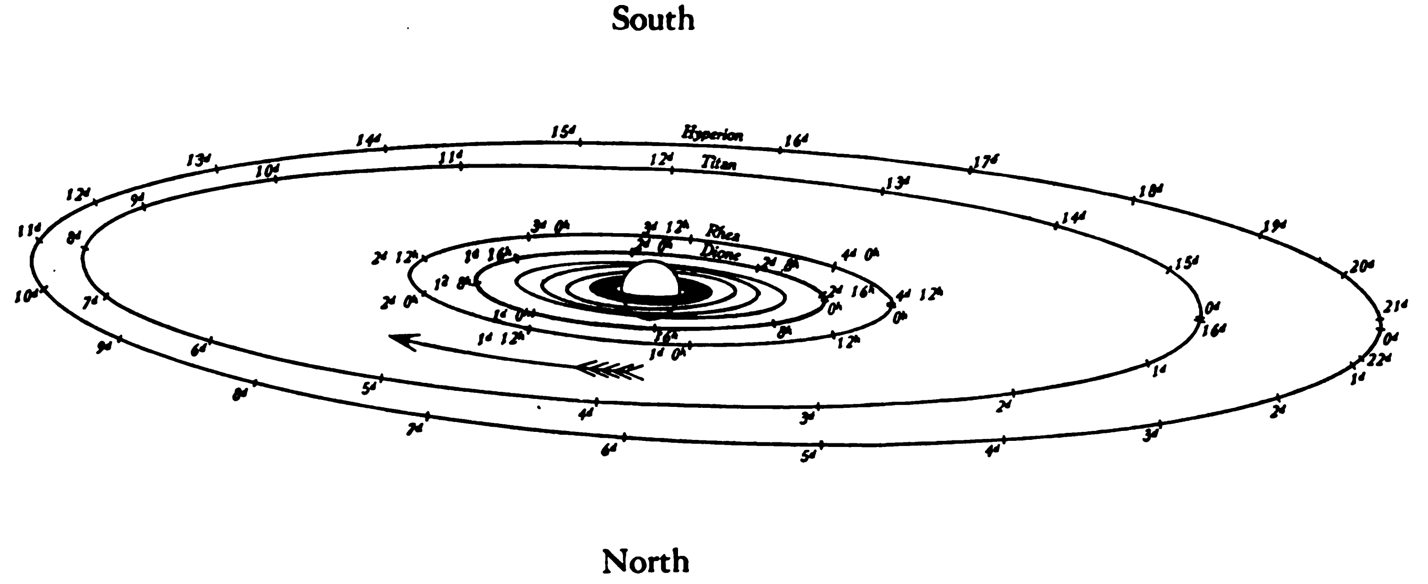
ELEMENTS FOR DETERMINING THE GEOCENTRIC POSITION, APPEARANCE, AND MAGNITUDE OF SATURN'S RINGS.

Greenwich Mean Midnight.	a	b	P	B	U	ω	B′	U′	Stellar Mag.
	″	″	° ′	° ′	° ′	° ′	° ′	° ′	
Jan. 7	44.49	− 8.41	−6 24.9	−10 53.7	24 21.2	42 19.9	−12 34.0	338 18.2	+0.5
15	44.91	8.66	6 26.4	11 7.1	23 57.2	42 19.9	12 27.0	338 34.4	0.4
23	45.24	8.92	6 28.1	11 22.6	23 28.8	42 19.8	12 20.0	338 50.5	0.4
31	45.48	9.19	6 30.1	11 39.5	22 56.9	42 19.8	12 13.0	339 6.7	0.3
Feb. 8	45.61	9.45	6 32.1	11 57.2	22 22.6	42 19.8	12 6.0	339 22.8	0.3
16	45.63	− 9.69	−6 34.2	−12 15.0	21 47.2	42 19.7	−11 59.0	339 38.9	+0.2
24	45.54	9.89	6 36.2	12 32.4	21 12.1	42 19.7	11 52.0	339 54.9	0.3
Mar. 4	45.34	10.06	6 38.0	12 48.7	20 38.5	42 19.7	11 44.9	340 11.0	0.3
12	45.04	10.18	6 39.7	13 3.5	20 7.6	42 19.6	11 37.9	340 27.0	0.4
20	44.65	10.25	6 41.2	13 16.3	19 40.4	42 19.6	11 30.9	340 43.0	0.4
28	44.19	−10.27	−6 42.3	−13 26.5	19 18.0	42 19.5	−11 23.7	340 59.0	+0.4
Apr. 5	43.67	10.24	6 43.2	13 33.9	19 1.0	42 19.5	11 16.6	341 14.9	0.5
13	43.10	10.17	6 43.8	13 38.6	18 49.9	42 19.5	11 9.5	341 30.9	0.5
21	42.51	10.05	6 44.0	13 40.3	18 45.0	42 19.4	11 2.4	341 46.8	0.6
29	41.91	9.89	6 43.9	13 39.0	18 46.4	42 19.4	10 55.2	342 2.7	0.6
May 7	41.31	− 9.69	−6 43.5	−13 34.7	18 54.1	42 19.4	−10 48.1	342 18.6	+0.7
15	40.71	9.46	6 42.7	13 27.5	19 8.0	42 19.3	10 41.0	342 34.4	0.7
23	40.13	9.22	6 41.7	13 17.5	19 27.7	42 19.3	10 33.8	342 50.3	0.7
31	39.58	8.96	6 40.3	13 5.0	19 53.0	42 19.2	10 26.6	343 6.1	0.8
June 8	39.06	8.68	6 38.6	12 50.1	20 23.4	42 19.2	10 19.4	343 21.9	0.8
16	38.59	− 8.39	−6 36.6	−12 33.0	20 58.5	42 19.2	−10 12.2	343 37.7	+0.8
24	38.16	8.09	6 34.4	12 13.8	21 37.8	42 19.1	10 5.0	343 53.4	0.8
July 2	37.78	7.78	6 31.9	11 52.8	22 20.7	42 19.1	9 57.8	344 9.2	0.8
10	37.44	7.47	6 29.2	11 30.2	23 6.8	42 19.1	9 50.6	344 24.9	0.9
18	37.16	7.16	6 26.3	11 6.2	23 55.7	42 19.0	9 43.4	344 40.6	0.9
26	36.93	− 6.85	−6 23.2	−10 41.1	24 46.8	42 19.0	− 9 36.2	344 56.3	+0.9
Aug. 3	36.75	6.54	6 19.9	10 15.1	25 39.5	42 19.0	9 29.0	345 12.0	0.9
11	36.62	6.24	6 16.4	9 48.4	26 33.5	42 18.9	9 21.7	345 27.6	0.9
19	36.55	5.94	6 12.9	9 21.3	27 28.3	42 18.9	9 14.4	345 43.3	0.8
27	36.54	5.65	6 9.2	8 54.0	28 23.4	42 18.8	9 7.2	345 58.9	0.8
Sept. 4	36.58	− 5.37	−6 5.5	− 8 26.7	29 18.3	42 18.8	− 8 59.9	346 14.5	+0.9
12	36.67	5.10	6 1.7	7 59.7	30 12.5	42 18.8	8 52.6	346 30.1	0.9
20	36.82	4.84	5 58.0	7 33.4	31 5.5	42 18.7	8 45.3	346 45.6	1.0
28	37.03	4.60	5 54.3	7 8.0	31 56.9	42 18.7	8 38.0	347 1.2	1.0
Oct. 6	37.29	4.37	5 50.7	6 43.7	32 46.2	42 18.6	8 30.7	347 16.7	1.0
14	37.61	− 4.16	−5 47.2	− 6 20.8	33 32.8	42 18.6	− 8 23.4	347 32.2	+1.1
22	37.97	3.96	5 44.0	5 59.6	34 16.2	42 18.6	8 16.1	347 47.7	1.1
30	38.38	3.79	5 41.0	5 40.5	34 55.9	42 18.5	8 8.8	348 3.2	1.1
Nov. 7	88.84	3.65	5 38.3	5 23.7	35 31.5	42 18.5	8 1.5	348 18.6	1.1
15	39.34	3.53	5 35.9	5 9.4	36 2.4	42 18.5	7 54.1	348 34.1	1.1
23	39.88	− 3.45	−5 33.9	− 4 57.9	36 28.2	42 18.4	− 7 46.8	348 49.5	+1.1
Dec. 1	40.45	3.40	5 32.3	4 49.4	36 48.5	42 18.4	7 39.5	349 4.9	1.0
9	41.03	3.39	5 31.2	4 44.1	37 2.8	42 18.4	7 32.1	349 20.3	1.0
17	41.62	3.41	5 30.6	4 42.1	37 11.0	42 18.3	7 24.8	349 35.7	1.0
25	42.21	3.48	5 30.5	4 43.3	37 13.0	42 18.3	7 17.4	349 51.1	1.0
33	42.78	− 3.58	−5 30.9	− 4 47.9	37 8.7	42 18.2	− 7 10.0	350 6.4	+0.9

The factor to be multiplied by *a* and *b* to obtain the axes of—

The inner ellipse of the outer ring=0.8801,	log factor=9.9445
The outer ellipse of the inner ring=0.8599,	log factor=9.9344
The inner ellipse of the inner ring=0.6650,	log factor=9.8228
The inner ellipse of the dusky ring=0.5486,	log factor=9.7392

NOTE.—The negative sign of B indicates that the visible surface of the rings is the southern one.



APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,

AT DATE OF OPPOSITION, FEBRUARY 14, 1919,

AS SEEN IN AN INVERTING TELESCOPE.

Names of the Satellites.	
I.	Mimas.
II.	Enceladus.
III.	Tethys.
IV.	Dione.
V.	Rhea.
VI.	Titan.
VII.	Hyperion.
VIII.	Iapetus.
IX.	Phœbe.

Mean Synodic Periods.	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.6
VIII.	79	22.1
IX.	523	15.6

GREENWICH MEAN TIME.

In the diagram on the preceding page, the points of the orbits marked "0" are those of the eastern elongation, as seen in an inverting telescope. The times of these elongations may be found from the following tables, and the apparent position of a satellite at any other time may be marked on the diagram by setting off on the proper orbit the elapsed interval in days and hours since the last eastern elongation. The orbits of the five inner satellites are regarded as circular, and the time of any greatest elongation not given in the tables may be readily found from those given by adding or subtracting the proper multiple of the mean synodic period. For Titan, Hyperion, and Iapetus the eccentricity is taken into account, and for Iapetus the times both of the greatest elongations and of the conjunctions are given. The following abbreviations are used in the tables:

E., Eastern Elongation.
W., Western Elongation.
I., Inferior Conjunction (north of planet).
S., Superior Conjunction (south of planet).

MIMAS.

Greatest Elongations Visible in the United States.

	d h		d h		d h		d h		d h		d h
Jan.	1 18.5 W.	Jan.	30 23.5 W.	Feb.	28 17.2 E.	Apr.	1 18.2 E.	May	14 15.4 W.	Nov.	22 0.0 W.
	2 17.1 W.		31 22.1 W.	Mar.	1 15.9 E.		2 16.8 E.		15 14.0 W.		22 22.6 W.
	3 15.7 W.	Feb.	1 20.8 W.		2 14.5 E.		3 15.4 E.		19 19.8 E.		23 21.2 W.
	4 14.3 W.		2 19.4 W.		3 13.1 E.		4 14.0 E.		20 18.5 E.		24 19.9 W.
	5 1.6 E.		3 18.0 W.		4 0.4 W.		5 12.7 E.		21 17.1 E.		25 18.5 W.
	6 0.3 E.		4 16.6 W.		4 11.7 E.		6 22.6 W.		22 15.7 E.		29 1.6 E.
	6 22.9 E.		5 15.2 W.		4 23.0 W.		7 21.2 W.		23 14.3 E.		30 0.3 E.
	7 21.5 E.		6 13.8 W.		5 21.6 W.		8 19.8 W.		24 12.9 E.		30 22.9 E.
	8 20.1 E.		7 1.1 E.		6 20.2 W.		9 18.4 W.		28 18.8 W.	Dec.	1 21.5 E.
	9 18.7 E.		7 12.4 W.		7 18.8 W.		10 17.1 W.		29 17.4 W.		2 20.1 E.
	10 17.3 E.		7 23.7 E.		8 17.5 W.		11 15.7 W.		30 16.0 W.		3 18.7 E.
	11 15.9 E.		8 22.4 E.		9 16.1 W.		12 14.3 W.		31 14.6 W.		4 17.4 E.
	12 14.6 E.		9 21.0 E.		10 14.7 W.		13 12.9 W.	June	1 13.2 W.		7 1.9 W.
	13 1.9 W.		10 19.6 E.		11 13.3 W.		15 21.5 E.		6 17.7 E.		8 0.5 W.
	14 0.5 W.		11 18.2 E.		12 11.9 W.		16 20.1 E.		7 16.3 E.		8 23.1 W.
	14 23.1 W.		12 16.8 E.		12 23.2 E.		17 18.7 E.		8 14.9 E.		9 21.8 W.
	15 21.7 W.		13 15.4 E.		13 21.8 E.		18 17.3 E.		9 13.6 E.		10 20.4 W.
	16 20.3 W.		14 14.0 E.		14 20.5 E.		19 15.9 E.		14 18.0 W.		11 19.0 W.
	17 18.9 W.		15 1.3 W.		15 19.1 E.		20 14.6 E.		15 16.6 W.		12 17.6 W.
	18 17.5 W.		15 12.6 E.		16 17.7 E.		21 13.2 E.		16 15.2 W.		15 2.2 E.
	19 16.2 W.		16 0.0 W.		17 16.3 E.		23 21.7 W.		17 13.8 W.		16 0.8 E.
	20 14.8 W.		16 22.6 W.		18 14.9 E.		24 20.4 W.		. . . .		16 23.4 E.
	21 2.1 E.		17 21.2 W.		19 13.5 E.		25 19.0 W.		. . . .		17 22.0 E.
	21 13.4 W.		18 19.8 W.		20 12.2 E.		26 17.6 W.	Oct.	30 20.4 E.		18 20.6 E.
	22 0.7 E.		19 18.4 W.		20 23.5 W.		27 16.2 W.		31 19.1 E.		19 19.2 E.
	22 23.3 E.		20 17.0 W.		21 22.1 W.		28 14.8 W.	Nov.	5 0.8 W.		20 17.8 E.
	23 21.9 E.		21 15.6 W.		22 20.7 W.		29 13.5 W.		5 23.5 W.		21 16.5 E.
	24 20.5 E.		22 14.2 W.		23 19.3 W.	May	2 20.6 E.		6 22.1 W.		23 2.4 W.
	25 19.1 E.		23 1.6 E.		24 17.9 W.		3 19.2 E.		7 20.7 W.		24 1.0 W.
	26 17.8 E.		23 12.9 W.		25 16.6 W.		4 17.9 E.		8 19.3 W.		24 23.6 W.
	27 16.4 E.		24 0.2 E.		26 15.2 W.		5 16.5 E.		13 1.1 E.		25 22.2 W.
	28 15.0 E.		24 11.5 W.		27 13.8 W.		6 15.1 E.		13 23.7 E.		26 20.8 W.
	29 2.3 W.		24 22.8 E.		28 12.4 W.		7 13.7 E.		14 22.4 E.		27 19.5 W.
	29 13.6 E.		25 21.4 E.		29 22.3 E.		11 19.5 W.		15 21.0 E.		28 18.1 W.
	30 0.9 W.		26 20.0 E.		30 21.0 E.		12 18.2 W.		16 19.6 E.		29 16.7 W.
	30 12.2 E.		27 18.6 E.		31 19.6 E.		13 16.8 W.		21 1.4 W.		31 2.6 E.

GREENWICH MEAN TIME.

ENCELADUS.

	d h		d h		d h		d h		d h		d h
Jan.	1 9.7 E.	Feb.	10 3.1 E.	Mar.	21 20.5 E.	Apr.	30 14.2 E.	June	9 8.1 E.	Nov.	23 13.6 E.
	2 18.6 E.		11 12.0 E.		23 5.4 E.	May	1 23.1 E.		10 17.0 E.		24 22.4 E.
	4 3.4 E.		12 20.8 E.		24 14.3 E.		3 8.0 E.		12 1.9 E.		26 7.3 E.
	5 12.3 E.		14 5.7 E.		25 23.2 E.		4 16.9 E.		13 10.8 E.		27 16.2 E.
	6 21.2 E.		15 14.6 E.		27 8.1 E.		6 1.8 E.		14 19.7 E.		29 1.1 E.
	8 6.1 E.		16 23.5 E.		28 17.0 E.		7 10.7 E.		16 4.6 E.		30 10.0 E.
	9 14.9 E.		18 8.3 E.		30 1.8 E.		8 19.6 E.		17 13.5 E.	Dec.	1 18.9 E.
	10 23.8 E.		19 17.2 E.		31 10.7 E.		10 4.5 E.		18 22.4 E.		3 3.8 E.
	12 8.7 E.		21 2.1 E.	Apr.	1 19.6 E.		11 13.3 E.		20 7.3 E.		4 12.7 E.
	13 17.6 E.		22 11.0 E.		3 4.5 E.		12 22.2 E.		. . . .		5 21.5 E.
	15 2.4 E.		23 19.8 E.		4 13.4 E.		14 7.1 E.		. . . .		7 6.4 E.
	16 11.3 E.		25 4.7 E.		5 22.3 E.		15 16.0 E.	Oct.	29 21.5 E.		8 15.3 E.
	17 20.2 E.		26 13.6 E.		7 7.1 E.		17 0.9 E.		31 6.4 E.		10 0.2 E.
	19 5.1 E.		27 22.5 E.		8 16.0 E.		18 9.8 E.	Nov.	1 15.3 E.		11 9.1 E.
	20 14.0 E.	Mar.	1 7.4 E.		10 0.9 E.		19 18.7 E.		3 0.2 E.		12 18.0 E.
	21 22.8 E.		2 16.2 E.		11 9.8 E.		21 3.6 E.		4 9.1 E.		14 2.9 E.
	23 7.7 E.		4 1.1 E.		12 18.7 E.		22 12.5 E.		5 18.0 E.		15 11.7 E.
	24 16.6 E.		5 10.0 E.		14 3.6 E.		23 21.4 E.		7 2.9 E.		16 20.6 E.
	26 1.5 E.		6 18.9 E.		15 12.4 E.		25 6.3 E.		8 11.8 E.		18 5.5 E.
	27 10.3 E.		8 3.8 E.		16 21.3 E.		26 15.2 E.		9 20.7 E.		19 14.4 E.
	28 19.2 E.		9 12.6 E.		18 6.2 E.		28 0.1 E.		11 5.5 E.		20 23.3 E.
	30 4.1 E.		10 21.5 E.		19 15.1 E.		29 9.0 E.		12 14.4 E.		22 8.2 E.
	31 13.0 E.		12 6.4 E.		21 0.0 E.		30 17.9 E.		13 23.3 E.		23 17.0 E.
Feb.	1 21.8 E.		13 15.3 E.		22 8.9 E.	June	1 2.8 E.		15 8.2 E.		25 1.9 E.
	3 6.7 E.		15 0.1 E.		23 17.8 E.		2 11.7 E.		16 17.1 E.		26 10.8 E.
	4 15.6 E.		16 9.0 E.		25 2.7 E.		3 20.6 E.		18 2.0 E.		27 19.7 E.
	6 0.5 E.		17 17.9 E.		26 11.6 E.		5 5.4 E.		19 10.9 E.		29 4.6 E.
	7 9.3 E.		19 2.8 E.		27 20.4 E.		6 14.3 E.		20 19.8 E.		30 13.4 E.
	8 18.2 E.		20 11.7 E.		29 5.3 E.		7 23.2 E.		22 4.7 E.		31 22.3 E.

TETHYS.

	d h		d h		d h		d h		d h		d h
Jan.	1 21.7 E.	Feb.	10 12.9 E.	Mar.	22 4.0 E.	Apr.	30 19.4 E.	June	9 11.2 E.	Nov.	22 16.2 E.
	3 19.0 E.		12 10.2 E.		24 1.3 E.	May	2 16.8 E.		11 8.5 E.		24 13.5 E.
	5 16.3 E.		14 7.4 E.		25 22.6 E.		4 14.1 E.		13 5.8 E.		26 10.8 E.
	7 13.6 E.		16 4.7 E.		27 19.9 E.		6 11.4 E.		15 3.2 E.		28 8.2 E.
	9 10.9 E.		18 2.0 E.		29 17.2 E.		8 8.7 E.		17 0.5 E.		30 5.5 E.
	11 8.2 E.		19 23.3 E.		31 14.5 E.		10 6.0 E.		18 21.8 E.	Dec.	2 2.8 E.
	13 5.5 E.		21 20.6 E.	Apr.	2 11.8 E.		12 3.3 E.		20 19.2 E.		4 0.1 E.
	15 2.8 E.		23 17.9 E.		4 9.1 E.		14 0.7 E.		. . . .		5 21.4 E.
	17 0.1 E.		25 15.2 E.		6 6.4 E.		15 22.0 E.		. . . .		7 18.7 E.
	18 21.4 E.		27 12.5 E.		8 3.7 E.		17 19.3 E.	Oct.	31 0.4 E.		9 16.0 E.
	20 18.7 E.	Mar.	1 9.8 E.		10 1.0 E.		19 16.6 E.	Nov.	1 21.7 E.		11 13.3 E.
	22 16.0 E.		3 7.1 E.		11 22.3 E.		21 14.0 E.		3 19.0 E.		13 10.6 E.
	24 13.3 E.		5 4.4 E.		13 19.7 E.		23 11.3 E.		5 16.4 E.		15 7.9 E.
	26 10.6 E.		7 1.6 E.		15 17.0 E.		25 8.6 E.		7 13.7 E.		17 5.2 E.
	28 7.8 E.		8 22.9 E.		17 14.3 E.		27 5.9 E.		9 11.0 E.		19 2.6 E.
	30 5.1 E.		10 20.2 E.		19 11.6 E.		29 3.2 E.		11 8.3 E.		20 23.9 E.
Feb.	1 2.4 E.		12 17.5 E.		21 8.9 E.		31 0.6 E.		13 5.6 E.		22 21.2 E.
	2 23.7 E.		14 14.8 E.		23 6.2 E.	June	1 21.9 E.		15 2.9 E.		24 18.5 E.
	4 21.0 E.		16 12.1 E.		25 3.5 E.		3 19.2 E.		17 0.3 E.		26 15.8 E.
	6 18.3 E.		18 9.4 E.		27 0.8 E.		5 16.5 E.		18 21.6 E.		28 13.1 E.
	8 15.6 E.		20 6.7 E.		28 22.1 E.		7 13.9 E.		20 18.9 E.		30 10.4 E.

GREENWICH MEAN TIME.

DIONE.

	d h		d h		d h		d h		d h		d h
Jan.	2 5.7 E.	Feb.	12 6.5 E.	Mar.	25 7.4 E.	May	5 8.6 E.	June	15 10.4 E.	Nov.	21 6.9 E.
	4 23.4 E.		15 0.2 E.		28 1.0 E.		8 2.3 E.		18 4.1 E.		24 0.6 E.
	7 17.0 E.		17 17.8 E.		30 18.7 E.		10 20.0 E.		20 21.8 E.		26 18.3 E.
	10 10.7 E.		20 11.5 E.	Apr.	2 12.4 E.		13 13.7 E.		23 15.5 E.		29 12.0 E.
	13 4.4 E.		23 5.1 E.		5 6.0 E.		16 7.4 E.		. . . .	Dec.	2 5.7 E.
	15 22.0 E.		25 22.8 E.		7 23.7 E.		19 1.2 E.		. . . .		4 23.4 E.
	18 15.7 E.		28 16.4 E.		10 17.4 E.		21 18.9 E.	Oct.	27 15.5 E.		7 17.1 E.
	21 9.3 E.	Mar.	3 10.1 E.		13 11.1 E.		24 12.6 E.		30 9.2 E.		10 10.8 E.
	24 3.0 E.		6 3.7 E.		16 4.8 E.		27 6.3 E.	Nov.	2 3.0 E.		13 4.5 E.
	26 20.6 E.		8 21.4 E.		18 22.4 E.		30 0.0 E.		4 20.7 E.		15 22.2 E.
	29 14.3 E.		11 15.0 E.		21 16.1 E.	June	1 17.7 E.		7 14.4 E.		18 15.9 E.
Feb.	1 7.9 E.		14 8.7 E.		24 9.8 E.		4 11.5 E.		10 8.1 E.		21 9.6 E.
	4 1.6 E.		17 2.4 E.		27 3.5 E.		7 5.2 E.		13 1.8 E.		24 3.2 E.
	6 19.2 E.		19 20.0 E.		29 21.2 E.		9 22.9 E.		15 19.5 E.		26 20.9 E.
	9 12.9 E.		22 13.7 E.	May	2 14.9 E.		12 16.6 E.		18 13.2 E.		29 14.6 E.

RHEA.

	d h		d h		d h		d h		d h		d h
Jan.	1 16.3 E.	Feb.	11 7.3 E.	Mar.	23 22.3 E.	May	3 13.9 E.	June	13 6.4 E.	Nov.	23 2.2 E.
	6 4.6 E.		15 19.6 E.		28 10.6 E.		8 2.4 E.		17 18.9 E.		27 14.7 E.
	10 16.9 E.		20 7.9 E.	Apr.	1 23.0 E.		12 14.8 E.		. . . .	Dec.	2 3.1 E.
	15 5.3 E.		24 20.2 E.		6 11.4 E.		17 3.3 E.		. . . .		6 15.6 E.
	19 17.6 E.	Mar.	1 8.6 E.		10 23.8 E.		21 15.8 E.	Oct.	31 11.7 E.		11 4.0 E.
	24 6.0 E.		5 20.9 E.		15 12.2 E.		26 4.3 E.	Nov.	5 0.2 E.		15 16.5 E.
	28 18.3 E.		10 9.2 E.		20 0.6 E.		30 16.8 E.		9 12.7 E.		20 4.9 E.
Feb.	2 6.6 E.		14 21.6 E.		24 13.0 E.	June	4 5.3 E.		14 1.2 E.		24 17.3 E.
	6 19.0 E.		19 9.9 E.		29 1.5 E.		8 17.8 E.		18 13.7 E.		29 5.7 E.

TITAN.

	d h		d h		d h		d h		d h		d h
Jan.	3 18.8 W.	Feb.	20 11.5 W.	Apr.	9 4.8 W.	May	27 1.8 W.	Oct.	18 5.9 W.	Dec.	5 5.2 W.
	11 23.2 E.		28 16.0 E.		17 9.9 E.	June	4 7.5 E.		26 10.6 E.		13 9.2 E.
	19 16.6 W.	Mar.	8 9.0 W.		25 3.4 W.		12 1.6 W.	Nov.	3 6.0 W.		21 4.2 W.
	27 20.9 E.		16 13.6 E.	May	3 8.7 E.		20 7.4 E.		11 10.5 E.		29 7.9 E.
Feb.	4 14.1 W.		24 6.8 W.		11 2.4 W.		. . . .		19 5.8 W.		. . . .
	12 18.5 E.	Apr.	1 11.6 E.		19 7.9 E.		. . . .		27 10.0 E.		. . . .

HYPERION.

	d h		d h		d h		d h		d h		d h
Jan.	11 8.0 W.	Feb.	22 14.0 W.	Apr.	5 22.6 W.	May	18 12.5 W.		. . . .	Nov.	27 14.5 W.
	21 19.8 E.	Mar.	5 1.8 E.		16 11.9 E.		29 5.0 E.	Oct.	26 23.8 E.	Dec.	8 22.1 E.
Feb.	1 11.0 W.		15 17.8 W.		27 4.9 W.	June	8 21.6 W.	Nov.	6 4.5 W.		18 23.4 W.
	11 22.6 E.		26 6.1 E.	May	7 19.6 E.		19 16.0 E.		17 11.7 E.		30 6.9 E.

IAPETUS.

	d h		d h		d h		d h		d h		d h
Jan.	20 8.4 I.	Feb.	27 14.3 S.	Apr.	8 15.7 I.	May	17 12.3 S.	Oct.	26 22.5 S.	Dec.	6 15.0 I.
Feb.	7 21.9 W.	Mar.	20 3.8 E.		27 10.7 W.	June	7 15.6 E.	Nov.	17 1.5 E.		25 14.5 W.

DIFFERENTIAL COORDINATES OF PHOEBE.

FOR GREENWICH MEAN NOON.

Date.	$\alpha_{Ph.}-\alpha_{Sat.}$		$\delta_{Ph.}-\delta_{Sat.}$		Date.	$\alpha_{Ph.}-\alpha_{Sat.}$		$\delta_{Ph.}-\delta_{Sat.}$		Date.	$\alpha_{Ph.}-\alpha_{Sat.}$		$\delta_{Ph.}-\delta_{Sat.}$	
	m	s	′	″		m	s	′	″		m	s	′	″
Jan. 1	−1	11.5	+ 9	11	Apr. 15	−2	24.1	+12	26		.	. . .	.	. .
3	1	13.9	9	23	17	2	24.2	12	23		.	. . .	.	. .
5	1	16.3	9	34	19	2	24.2	12	20	Sept. 25	+0	20.0	− 3	49
7	1	18.6	9	45	21	2	24.2	12	16	27	0	23.2	4	8
9	1	21.0	9	56	23	2	24.1	12	13	29	0	26.4	4	26
11	−1	23.3	+10	6	25	−2	24.0	+12	9	Oct. 1	+0	29.5	− 4	45
13	1	25.6	10	16	27	2	23.8	12	6	3	0	32.6	5	3
15	1	27.8	10	26	29	2	23.5	12	2	5	0	35.6	5	21
17	1	30.0	10	36	May 1	2	23.2	11	57	7	0	38.6	5	39
19	1	32.2	10	45	3	2	22.8	11	53	9	0	41.6	5	57
21	−1	34.4	+10	54	5	−2	22.4	+11	48	11	+0	44.6	− 6	14
23	1	36.5	11	2	7	2	21.9	11	44	13	0	47.5	6	31
25	1	38.6	11	10	9	2	21.3	11	39	15	0	50.3	6	48
27	1	40.6	11	18	11	2	20.7	11	34	17	0	53.1	7	5
29	1	42.6	11	26	13	2	20.0	11	28	19	0	55.8	7	21
31	−1	44.6	+11	33	15	−2	19.3	+11	23	21	+0	58.5	− 7	36
Feb. 2	1	46.5	11	39	17	2	18.5	11	17	23	1	1.1	7	52
4	1	48.4	11	46	19	2	17.7	11	11	25	1	3.7	8	7
6	1	50.2	11	52	21	2	16.8	11	5	27	1	6.2	8	21
8	1	52.0	11	57	23	2	15.8	10	58	29	1	8.7	8	35
10	−1	53.7	+12	3	25	−2	14.8	+10	52	31	+1	11.0	− 8	48
12	1	55.4	12	8	27	2	13.7	10	45	Nov. 2	1	13.3	9	1
14	1	57.1	12	12	29	2	12.5	10	38	4	1	15.6	9	14
16	1	58.7	12	17	31	2	11.3	10	31	6	1	17.7	9	26
18	2	0.3	12	21	June 2	2	10.1	10	23	8	1	19.8	9	38
20	−2	1.8	+12	25	4	−2	8.8	+10	16	10	+1	21.8	− 9	49
22	2	3.3	12	28	6	2	7.4	10	8	12	1	23.7	9	59
24	2	4.7	12	31	8	2	5.9	10	0	14	1	25.6	10	9
26	2	6.1	12	34	10	2	4.4	9	51	16	1	27.3	10	18
28	2	7.4	12	36	12	2	2.9	9	42	18	1	29.0	10	27
Mar. 2	−2	8.7	+12	39	14	−2	1.3	+ 9	33	20	+1	30.6	−10	35
4	2	10.0	12	41	16	1	59.6	9	24	22	1	32.1	10	42
6	2	11.2	12	42	18	1	57.9	9	15	24	1	33.6	10	49
8	2	12.3	12	43	20	1	56.1	9	5	26	1	34.9	10	55
10	2	13.4	12	44	22	1	54.3	8	55	28	1	36.2	11	1
12	−2	14.5	+12	45	24	−1	52.4	+ 8	44	30	+1	37.3	−11	6
14	2	15.5	12	46	26	1	50.5	8	34	Dec. 2	1	38.4	11	10
16	2	16.4	12	46	28	1	48.5	8	23	4	1	39.4	11	14
18	2	17.3	12	46	30	1	46.4	8	12	6	1	40.3	11	17
20	2	18.1	12	46	July 2	1	44.3	8	0	8	1	41.1	11	19
22	−2	18.9	+12	46	4	−1	42.1	+ 7	49	10	+1	41.8	−11	21
24	2	19.6	12	45	6	1	39.9	7	37	12	1	42.4	11	22
26	2	20.3	12	45	8	1	37.6	7	24	14	1	43.0	11	23
28	2	20.9	12	44	10	1	35.3	7	12	16	1	43.5	11	23
30	2	21.5	12	43	12	1	33.0	6	59	18	1	43.8	11	22
Apr. 1	−2	22.0	+12	41	14	−1	30.6	+ 6	46	20	+1	44.1	−11	21
3	2	22.5	12	40	16	1	28.1	6	32	22	1	44.3	11	19
5	2	22.9	12	38	18	1	25.6	6	18	24	1	44.4	11	16
7	2	23.3	12	36	20	1	23.0	6	4	26	1	44.5	11	13
9	2	23.6	12	34	22	1	20.4	5	50	28	1	44.4	11	9
11	−2	23.8	+12	31	24	−1	17.7	+ 5	35	30	+1	44.3	−11	5
13	−2	24.0	+12	28	26	−1	15.0	+ 5	20	32	+1	44.0	−11	0

Time from Eastern Elongation.	Mimas.		Time from Eastern Elongation.		Enceladus.		Tethys.		Time from Eastern Elongation.		Dione.	
	p^1	F			p^1	F	p^1	F			p^1	F
h	°		d	h	°		°		d	h	°	
0.0	84.0	1.000	0	0	84.0	1.000	84.0	1.000	0	0	84.0	1.000
0.5	82.2	0.991	0	1	81.7	0.983	82.4	0.991	0	2	81.7	0.983
1.0	80.4	0.964	0	2	79.2	0.931	80.8	0.963	0	4	79.2	0.931
1.5	78.4	0.919	0	3	76.3	0.848	79.0	0.918	0	6	76.3	0.847
2.0	76.2	0.858	0	4	72.6	0.736	77.0	0.856	0	8	72.6	0.736
2.5	73.6	0.781	0	5	67.4	0.602	74.6	0.779	0	10	67.4	0.601
3.0	70.3	0.692	0	6	59.0	0.454	71.7	0.689	0	12	59.0	0.453
3.5	66.0	0.592	0	7	42.5	0.309	67.8	0.588	0	14	42.4	0.307
4.0	59.9	0.486	0	8	5.4	0.214	62.3	0.479	0	16	4.9	0.213
4.5	50.3	0.379	0	9	318.5	0.255	53.3	0.369	0	18	318.0	0.256
5.0	33.7	0.283	0	10	294.7	0.388	37.2	0.267	0	20	294.5	0.389
5.5	5.0	0.225	0	11	283.7	0.538	6.9	0.203	0	22	283.5	0.540
6.0	330.5	0.240	0	12	277.4	0.680	328.7	0.218	1	0	277.3	0.681
6.5	306.8	0.317	0	13	273.2	0.802	304.0	0.300	1	2	273.1	0.804
7.0	293.4	0.419	0	14	270.0	0.898	291.0	0.407	1	4	270.0	0.900
7.5	285.5	0.527	0	15	267.4	0.964	283.5	0.517	1	6	267.4	0.965
8.0	280.2	0.631	0	16	265.0	0.997	278.7	0.624	1	8	265.0	0.997
8.5	276.4	0.728	0	17	262.7	0.994	275.2	0.722	1	10	262.7	0.994
9.0	273.4	0.812	0	18	260.3	0.958	272.5	0.808	1	12	260.3	0.957
9.5	270.9	0.883	0	19	257.6	0.888	270.3	0.880	1	14	257.6	0.886
10.0	268.8	0.938	0	20	254.4	0.789	268.4	0.936	1	16	254.3	0.786
10.5	266.9	0.976	0	21	250.0	0.664	266.6	0.975	1	18	249.9	0.660
11.0	265.1	0.996	0	22	243.4	0.521	265.0	0.996	1	20	243.2	0.516
11.5	263.3	0.999	0	23	231.4	0.371	263.4	0.999	1	22	231.0	0.366
12.0	261.5	0.983	1	0	205.2	0.244	261.9	0.984	2	0	204.1	0.241
12.5	259.7	0.948	1	1	157.0	0.219	260.2	0.950	2	2	155.4	0.221
13.0	257.6	0.897	1	2	122.9	0.324	258.3	0.899	2	4	122.0	0.328
13.5	255.2	0.830	1	3	107.7	0.472	256.2	0.831	2	6	107.3	0.476
14.0	252.4	0.749	1	4	99.8	0.619	253.7	0.750	2	8	99.6	0.624
14.5	248.8	0.655	1	5	94.9	0.751	250.8	0.655	2	10	94.7	0.755
15.0	244.0	0.552	1	6	91.4	0.859	246.2	0.551	2	12	91.2	0.863
15.5	236.8	0.445	1	7	88.5	0.939	239.7	0.441	2	14	88.4	0.941
16.0	225.1	0.339	1	8	86.1	0.986	228.9	0.332	2	16	86.0	0.988
16.5	204.2	0.254	1	9	83.7	1.000	208.6	0.239	2	18	83.6	1.000
17.0	171.4	0.221	1	10	81.4	0.978	173.2	0.198	2	20	81.3	0.977
17.5	139.8	0.264	1	11			138.3	0.242				
18.0	120.8	0.354	1	12			118.6	0.336				
18.5	109.9	0.460	1	13			108.0	0.445				
19.0	103.2	0.568	1	14			101.6	0.555				
19.5	98.6	0.669	1	15			97.3	0.659				
20.0	95.1	0.761	1	16			94.2	0.753				
20.5	92.4	0.841	1	17			91.7	0.834				
21.0	90.1	0.906	1	18			89.6	0.901				
21.5	88.1	0.955	1	19			87.8	0.951				
22.0	86.2	0.986	1	20			86.1	0.984				
22.5	84.4	1.000	1	21			84.5	0.999				
23.0	82.6	0.995	1	22			82.9	0.996				

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F\frac{a(\rho)}{\rho}$.

Time from Eastern Elongation.		Rhea.		Time from Eastern Elongation.		Titan.		Hyperion.		Time from Eastern Elongation.	Iapetus.	
		p^1	F			p^1	F	p^1	F		p^1	F
d	h	°		d	h	°		°		d	°	
0	0	84.0	1.000	0	0	84.0	0.982	84.0	1.084	0	91.5	1.016
0	3	81.8	0.986	0	10	81.9	0.965	82.7	1.078	2	91.5	1.000
0	6	79.5	0.943	0	20	79.7	0.922	81.3	1.060	4	91.4	0.960
0	9	76.9	0.874	1	6	77.2	0.853	79.9	1.030	6	91.3	0.896
0	12	73.8	0.780	1	16	74.2	0.762	78.4	0.989	8	91.3	0.810
0	15	69.7	0.666	2	2	70.2	0.651	76.7	0.936	10	91.2	0.704
0	18	63.7	0.537	2	12	64.5	0.525	74.8	0.872	12	91.0	0.579
0	21	53.7	0.401	2	22	54.9	0.392	72.6	0.799	14	90.8	0.440
1	0	34.1	0.278	3	8	36.0	0.270	69.9	0.717	16	90.4	0.289
1	3	355.6	0.216	3	18	358.0	0.205	66.5	0.628	18	89.1	0.131
1	6	315.9	0.270	4	4	316.9	0.254	61.9	0.534	20	281.7	0.032
1	9	295.2	0.392	4	14	295.7	0.372	55.2	0.437	22	273.1	0.192
1	12	284.8	0.527	5	0	285.2	0.504	44.9	0.344	24	272.4	0.348
1	15	278.7	0.657	5	10	279.0	0.633	27.5	0.264	26	272.1	0.494
1	18	274.5	0.773	5	20	274.8	0.749	0.1	0.221	28	271.9	0.627
1	21	271.3	0.868	6	6	271.8	0.847	329.3	0.239	30	271.8	0.743
2	0	268.6	0.939	6	16	269.2	0.925	307.6	0.305	32	271.7	0.838
2	3	266.3	0.984	7	2	267.1	0.980	294.5	0.393	34	271.6	0.911
2	6	264.2	1.000	7	12	265.1	1.010	286.5	0.488	36	271.6	0.959
2	9	262.0	0.988	7	22	263.2	1.016	281.0	0.580	38	271.5	0.982
2	12	259.7	0.947	8	8	261.2	0.997	277.0	0.667	40	271.5	0.978
2	15	257.1	0.879	8	18	259.2	0.953	273.9	0.744	42	271.4	0.950
2	18	254.0	0.787	9	4	256.8	0.888	271.3	0.806	44	271.3	0.896
2	21	250.0	0.675	9	14	254.1	0.802	269.1	0.859	46	271.3	0.821
3	0	244.2	0.546	10	0	250.6	0.698	267.0	0.896	48	271.2	0.724
3	3	234.6	0.411	10	10	245.7	0.581	265.2	0.913	50	271.1	0.609
3	6	216.0	0.285	10	20	238.2	0.456	263.4	0.915	52	270.9	0.480
3	9	178.8	0.216	11	6	225.2	0.333	261.5	0.900	54	270.6	0.339
3	12	138.0	0.264	11	16	199.4	0.237	259.5	0.868	56	269.8	0.190
3	15	116.3	0.383	12	2	158.7	0.222	257.3	0.820	58	262.2	0.036
3	18	105.4	0.518	12	12	127.8	0.301	254.8	0.758	60	94.3	0.119
3	21	99.0	0.649	12	22	112.1	0.420	251.8	0.682	62	92.7	0.270
4	0	94.9	0.765	13	8	103.5	0.546	248.2	0.596	64	92.2	0.415
4	3	91.5	0.862	13	18	98.1	0.665	242.9	0.504	66	92.0	0.551
4	6	88.8	0.935	14	4	94.3	0.770	235.4	0.408	68	91.9	0.674
4	9	86.5	0.981	14	14	91.3	0.858	223.3	0.316	70	91.8	0.782
4	12	84.3	1.000	15	0	88.8	0.924	202.8	0.244	72	91.7	0.872
4	15	82.1	0.989	15	10	86.7	0.965	171.2	0.218	74	91.6	0.941
				15	20	84.6	0.982	143.0	0.254	76	91.6	0.988
				16	6	82.5	0.973	124.3	0.332	78	91.5	1.013
				16	16			113.3	0.426	80	91.5	1.013
				17	2			106.4	0.524	82	91.4	0.989
				17	12			101.6	0.620			
				17	22			98.1	0.711			
				18	8			95.4	0.794			
				18	18			93.1	0.868			
				19	4			91.2	0.933			
				19	14			89.5	0.986			
				20	0			88.0	1.029			
				20	10			86.6	1.059			
				20	20			85.2	1.078			
				21	6			83.9	1.084			
				21	16			82.6	1.077			

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F\frac{a(\rho)}{\rho}$.

FOR GREENWICH MEAN MIDNIGHT.

Date.	Mimas.		Enceladus.		Tethys.		Dione.	
	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$
	°	″	°	″	°	″	°	″
Jan. 1	+1.2	30.1	−0.4	38.6	−1.3	47.8	−0.4	61.
6	1.2	30.3	0.4	38.9	1.3	48.1	0.4	61.
11	1.2	30.5	0.4	39.1	1.3	48.4	0.4	62.
16	1.2	30.6	0.4	39.3	1.3	48.7	0.5	62.
21	1.2	30.8	0.5	39.5	1.3	48.9	0.5	62.
26	+1.1	30.9	−0.5	39.6	−1.3	49.1	−0.5	62.
31	1.1	31.0	0.5	39.8	1.3	49.2	0.5	63.
Feb. 5	1.0	31.1	0.5	39.8	1.3	49.3	0.5	63.
10	1.0	31.1	0.6	39.9	1.4	49.4	0.6	63.
15	0.9	31.1	0.6	39.9	1.4	49.4	0.6	63.
20	+0.8	31.1	−0.6	39.9	−1.4	49.4	−0.6	63.
25	0.7	31.0	0.6	39.8	1.4	49.3	0.6	63.
Mar. 2	0.6	30.9	0.6	39.7	1.4	49.2	0.6	62.
7	0.5	30.8	0.6	39.5	1.4	49.0	0.6	62.
12	0.4	30.7	0.7	39.4	1.4	48.7	0.7	62.
17	+0.3	30.5	−0.7	39.2	−1.4	48.5	−0.7	62.
22	+0.1	30.4	0.7	38.9	1.4	48.2	0.7	61.
27	0.0	30.2	0.7	38.7	1.4	47.9	0.7	61.
Apr. 1	−0.1	29.9	0.7	38.4	1.4	47.6	0.7	60.
6	0.3	29.7	0.7	38.1	1.4	47.2	0.7	60.
11	−0.4	29.5	−0.7	37.8	−1.4	46.8	−0.7	59.
16	0.6	29.2	0.7	37.5	1.4	46.4	0.7	59.
21	0.7	29.0	0.7	37.2	1.4	46.0	0.7	58.
26	0.8	28.7	0.7	36.8	1.4	45.6	0.7	58.
May 1	1.0	28.5	0.7	36.5	1.4	45.2	0.7	57.
6	−1.1	28.2	−0.7	36.2	−1.3	44.8	−0.7	57.
11	1.3	27.9	0.7	35.8	1.3	44.4	0.7	56.
16	1.4	27.7	0.7	35.5	1.3	44.0	0.7	56.
21	1.5	27.4	0.7	35.2	1.2	43.6	0.7	55.
26	1.6	27.2	0.7	34.9	1.2	43.2	0.7	55.
31	−1.7	27.0	−0.7	34.6	−1.2	42.8	−0.7	54.
June 5	1.8	26.8	0.6	34.3	1.1	42.5	0.7	54.
10	−1.9	26.5	−0.6	34.0	−1.1	42.2	−0.6	54.
. .	. . .	. . .	. .	. . .	. .	. . .	. .	. .
Nov. 7	+1.3	26.5	+0.4	34.0	+0.7	42.0	+0.4	53.
12	+1.4	26.7	+0.4	34.2	+0.8	42.4	+0.4	54.
17	1.6	26.9	0.4	34.5	0.8	42.7	0.4	54.
22	1.7	27.1	0.4	34.8	0.9	43.1	0.5	55.
27	1.8	27.4	0.5	35.1	0.9	43.5	0.5	55.
Dec. 2	1.9	27.6	0.5	35.4	0.9	43.8	0.5	56.
7	+2.0	27.9	+0.5	35.7	+1.0	44.2	+0.5	56.
12	2.0	28.1	0.5	36.1	1.0	44.6	0.5	57.
17	2.1	28.4	0.5	36.4	1.0	45.0	0.5	57.
22	2.1	28.6	0.5	36.7	1.0	45.5	0.5	58.
27	2.1	28.9	0.5	37.0	1.0	45.8	0.5	58.
32	+2.1	29.1	+0.5	37.3	+1.0	46.2	+0.5	59.

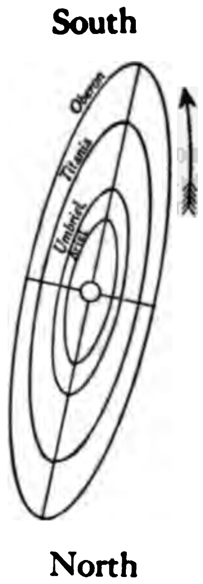
FOR GREENWICH MEAN MIDNIGHT.

Date.	Rhea.		Titan.		Hyperion.		Iapetus.	
	$P-P_0$	$\frac{\alpha(\rho)}{\rho}$	$P-P_0$	$\frac{\alpha(\rho)}{\rho}$	$P-P_0$	$\frac{\alpha(\rho)}{\rho}$	$P-P_0$	$\frac{\alpha(\rho)}{\rho}$
	°	″	°	″	°	″	°	″
Jan. 1	−0.5	85.4	0.0	198	0.0	240	+0.7	577
6	0.5	86.0	0.0	199	0.0	242	0.7	581
11	0.5	86.5	0.0	201	0.0	243	0.6	585
16	0.6	87.0	0.0	202	0.0	244	0.5	588
21	0.6	87.4	0.0	203	0.0	246	0.4	591
26	−0.6	87.8	−0.1	203	−0.1	247	+0.4	593
31	0.6	88.0	0.1	204	0.1	247	0.3	595
Feb. 5	0.6	88.2	0.1	204	0.1	248	0.2	596
10	0.7	88.3	0.1	205	0.1	248	+0.1	597
15	0.7	88.3	0.2	205	0.1	248	0.0	597
20	−0.7	88.3	−0.2	205	−0.2	248	−0.1	596
25	0.7	88.1	0.2	204	0.2	248	0.2	595
Mar. 2	0.7	87.9	0.2	204	0.2	247	0.3	594
7	0.7	87.6	0.2	203	0.2	246	0.4	592
12	0.8	87.2	0.2	202	0.2	245	0.5	589
17	−0.8	86.7	−0.3	201	−0.2	244	−0.5	586
22	0.8	86.2	0.3	200	0.2	242	0.6	582
27	0.8	85.7	0.3	199	0.2	241	0.7	579
Apr. 1	0.8	85.1	0.3	197	0.3	239	0.7	575
6	0.8	84.4	0.3	196	0.3	237	0.8	570
11	−0.8	83.7	−0.3	194	−0.3	235	−0.8	566
16	0.8	83.0	0.3	192	0.3	233	0.8	561
21	0.8	82.3	0.3	191	0.3	231	0.8	556
26	0.8	81.6	0.3	189	0.3	229	0.8	551
May 1	0.8	80.8	0.3	187	0.3	227	0.8	546
6	−0.8	80.1	−0.3	186	−0.3	225	−0.8	541
11	0.8	79.4	0.3	184	0.3	223	0.8	536
16	0.8	78.6	0.3	182	0.3	221	0.7	531
21	0.8	78.0	0.3	181	0.2	219	0.7	527
26	0.8	77.3	0.3	179	0.2	217	0.6	522
31	−0.8	76.6	−0.3	178	−0.2	215	−0.5	518
June 5	0.8	76.0	0.2	176	0.2	213	0.4	513
10	−0.8	75.4	−0.2	175	−0.2	212	−0.4	509
. .	. .	. . .	. .	. . .	. .	. . .	. .	. . .
Nov. 7	+0.2	75.2	+0.8	174	+0.6	211	+3.5	508
12	+0.2	75.8	+0.8	176	+0.6	213	+3.6	512
17	0.2	76.4	0.8	177	0.7	215	3.7	516
22	0.2	77.1	0.8	179	0.7	216	3.7	521
27	0.2	77.8	0.8	180	0.7	218	3.8	525
Dec. 2	0.2	78.4	0.9	182	0.7	220	3.8	530
7	+0.3	79.1	+0.9	183	+0.7	222	+3.9	535
12	0.3	79.9	0.9	185	0.7	224	3.9	540
17	0.3	80.6	0.9	187	0.7	226	3.9	544
22	0.3	81.3	0.9	188	0.7	228	3.9	549
27	0.3	82.0	0.9	190	0.7	230	3.9	554
32	+0.3	82.7	+0.9	192	+0.7	232	+3.9	559

APPARENT ORBITS OF THE SATELLITES OF URANUS AT DATE OF OPPOSITIO AUGUST 23, 1919, AS SEEN IN AN INVERTING TELESCOPE.

Apparent Apsides.

Date.	Position Angle.	App. Distances.	
		Ariel.	Umbriel.
	°	″	″
May 13	347.5	13.1	18.3
Aug. 21	347.9	13.9	19.4
Nov. 29	348.4	13.1	18.3



Apparent Apsides.

Date.	Position Angle.	App. Distanc	
		Titania.	Ober
	°	″	″
May 13	347.5	30.0	40.1
Aug. 21	347.9	31.8	42.5
Nov. 29	348.4	30.0	40.1

GREENWICH MEAN TIME OF GREATEST ELONGATION.

ARIEL.		UMBRIEL.		TITANIA.		OBERON.
North.	South.	North.	South.	North.	South.	North and South.
d h	d h	d h	d h	d h	d h	d h
May 29 21.5	June 2 16.2	May 15 20.3	May 17 22.0	May 9 17.2	May 14 1.6	June 8 9.9 N.
June 6 10.9	10 5.6	24 3.2	26 4.9	18 10.1	22 18.6	15 3.4 S.
14 0.4	17 19.1	June 1 10.1	June 3 11.8	27 3.0	31 11.5	21 21.0 N.
21 13.8	25 8.5	9 17.0	11 18.7	June 4 19.9	June 9 4.4	28 14.5 S.
29 3.3	July 2 22.0	17 23.9	20 1.6	13 12.8	17 21.3	July 5 8.1 N.
July 6 16.7	10 11.5	26 6.8	28 8.6	22 5.8	26 14.3	12 1.7 S.
14 6.2	18 0.9	July 4 13.8	July 6 15.5	30 22.7	July 5 7.2	18 19.2 N.
21 19.7	25 14.4	12 20.7	14 22.4	July 9 15.7	14 0.2	25 12.8 S.
29 9.1	Aug. 2 3.8	21 3.6	23 5.3	18 8.6	22 17.1	Aug. 1 6.4 N.
Aug. 5 22.6	9 17.3	29 10.5	31 12.2	27 1.6	31 10.0	8 0.0 S.
13 12.1	17 6.8	Aug. 6 17.4	Aug. 8 19.2	Aug. 4 18.5	Aug. 9 3.0	14 17.6 N.
21 1.5	24 20.3	15 0.4	17 2.1	13 11.5	17 20.0	21 11.2 S.
28 15.0	Sept. 1 9.7	23 7.3	25 9.0	22 4.5	26 13.0	28 4.8 N.
Sept. 5 4.5	8 23.2	31 14.2	Sept. 2 16.0	30 21.4	Sept. 4 5.9	Sept. 3 22.4 S.
12 18.0	16 12.7	Sept. 8 21.2	10 22.9	Sept. 8 14.4	12 22.9	10 16.0 N.
20 7.4	24 2.2	17 4.1	19 5.8	17 7.4	21 15.9	17 9.6 S.
27 20.9	Oct. 1 15.7	25 11.0	27 12.8	26 0.4	30 8.8	24 3.2 N.
Oct. 5 10.4	9 5.1	Oct. 3 18.0	Oct. 5 19.7	Oct. 4 17.4	Oct. 9 1.8	30 20.8 S.
12 23.9	16 18.6	12 0.9	14 2.7	13 10.3	17 18.8	Oct. 7 14.4 N.
20 13.4	24 8.1	20 7.9	22 9.6	22 3.3	26 11.8	14 8.0 S.
28 2.9	31 21.6	28 14.8	30 16.5	30 20.3	Nov. 4 4.7	21 1.6 N.
Nov. 4 16.4	Nov. 8 11.1	Nov. 5 21.7	Nov. 7 23.5	Nov. 8 13.2	12 21.7	27 19.1 S.
12 5.8	16 0.6	14 4.7	16 6.4	17 6.2	21 14.6	Nov. 3 12.7 N.
19 19.3	23 14.0	22 11.6	24 13.4	25 23.1	30 7.6	10 6.3 S.
27 8.8	Dec. 1 3.5	30 18.6	Dec. 2 20.3	Dec. 4 16.1	Dec. 9 0.5	16 23.8 N.

In the above diagram the central circle represents the planet.

For Ariel every third greatest elongation is given, and for Umbriel every alternate one; the intermediate ones may be found by adding multiples of the period of the satellite.

Sidereal period of Ariel, $2^d\ 12^h.489$; of Umbriel, $4^d\ 3^h.460$; of Titania, $8^d\ 16^h.941$; of Oberon, $13^d\ 11^h.118$.

Time from Northern Elongation.		Ariel.		Umbriel.		Time from Northern Elongation.		Titania.		Time from Northern Elongation.		Oberon.	
		p^1	F	p^1	F			p^1	F			p^1	F
d	h	°		°		d	h	°		d	h	°	
0	0	348.0	1.000	348.0	1.000	0	0	348.0	1.000	0	0	348.0	1.000
0	2	351.5	0.981	350.1	0.993	0	5	350.5	0.990	0	8	350.6	0.989
0	4	355.2	0.922	352.2	0.971	0	10	353.1	0.959	0	16	353.3	0.956
0	6	359.6	0.829	354.5	0.935	0	15	355.9	0.909	1	0	356.2	0.902
0	8	5.4	0.707	357.0	0.886	0	20	359.1	0.840	1	8	359.6	0.829
0	10	14.0	0.564	359.8	0.825	1	1	3.0	0.756	1	16	3.8	0.740
0	12	28.5	0.419	3.2	0.753	1	6	7.9	0.659	2	0	9.2	0.638
0	14	55.8	0.308	7.3	0.671	1	11	14.7	0.555	2	8	16.7	0.528
0	16	95.7	0.299	12.6	0.584	1	16	24.6	0.448	2	16	28.3	0.420
0	18	125.1	0.402	19.8	0.494	1	21	40.4	0.354	3	0	47.0	0.330
0	20	140.7	0.546	30.1	0.408	2	2	64.8	0.294	3	8	75.0	0.287
0	22	149.7	0.690	45.5	0.335	2	7	94.2	0.297	3	16	104.2	0.316
1	0	155.7	0.815	67.2	0.291	2	12	117.7	0.363	4	0	124.8	0.400
1	2	160.3	0.913	92.0	0.294	2	17	132.6	0.459	4	8	137.4	0.507
1	4	164.1	0.975	113.0	0.343	2	22	142.1	0.566	4	16	145.6	0.617
1	6	167.6	1.000	127.5	0.419	3	3	148.6	0.670	5	0	151.3	0.721
1	8	171.0	0.985	137.3	0.506	3	8	153.4	0.766	5	8	155.6	0.813
1	10	174.7	0.931	144.2	0.596	3	13	157.2	0.848	5	16	159.2	0.890
1	12	179.0	0.842	149.3	0.683	3	18	160.4	0.915	6	0	162.2	0.947
1	14	184.6	0.723	153.3	0.763	3	23	163.2	0.963	6	8	164.9	0.984
1	16	192.7	0.582	156.6	0.834	4	4	165.8	0.992	6	16	167.5	1.000
1	18	206.2	0.435	159.3	0.893	4	9	168.3	1.000	7	0	170.1	0.993
1	20	231.5	0.317	161.8	0.941	4	14	170.8	0.987	7	8	172.7	0.964
1	22	270.9	0.293	164.1	0.974	4	19	173.4	0.954	7	16	175.6	0.914
2	0	302.4	0.386	166.2	0.994	5	0	176.2	0.902	8	0	178.9	0.845
2	2	319.2	0.528	168.3	1.000	5	5	179.5	0.832	8	8	182.9	0.759
2	4	328.8	0.673	170.4	0.991	5	10	183.5	0.746	8	16	188.0	0.659
2	6	335.1	0.802	172.5	0.967	5	15	188.6	0.649	9	0	195.0	0.550
2	8	339.8	0.902	174.8	0.929	5	20	195.6	0.543	9	8	205.6	0.440
2	10	343.7	0.970	177.4	0.878	6	1	206.0	0.437	9	16	222.6	0.344
2	12	347.2	0.999	180.3	0.815	6	6	222.5	0.345	10	0	248.9	0.290
2	14	350.6	0.989	183.7	0.742	6	11	247.9	0.291	10	8	279.1	0.305
2	16			187.9	0.660	6	16	277.1	0.302	10	16	301.5	0.381
2	18			193.4	0.572	6	21	299.6	0.372	11	0	315.4	0.485
2	20			200.9	0.482	7	2	313.9	0.470	11	8	324.2	0.596
2	22			211.8	0.397	7	7	322.9	0.577	11	16	330.3	0.702
3	0			228.0	0.326	7	12	329.2	0.681	12	0	334.9	0.796
3	2			250.5	0.289	7	17	333.9	0.775	12	8	338.5	0.876
3	4			275.2	0.299	7	22	337.6	0.856	12	16	341.6	0.938
3	6			295.3	0.352	8	3	340.7	0.921	13	0	344.4	0.979
3	8			309.1	0.430	8	8	343.5	0.967	13	8	347.0	0.998
3	10			318.4	0.519	8	13	346.0	0.994	13	16	349.6	0.996
3	12			325.0	0.608	8	18	348.5	1.000				
3	14			329.9	0.694								
3	16			333.8	0.773								
3	18			337.0	0.842								
3	20			339.7	0.901								
3	22			342.1	0.946								
4	0			344.4	0.978								
4	2			346.5	0.996								
4	4			348.5	1.000								

Position angle of satellite $p = p^1 + (P - P_o)$.

Apparent distance of satellite $s = F\frac{a(\rho)}{\rho}$.

FOR GREENWICH MEAN NOON.

Date.	$P-P_0$	$\frac{\alpha(\rho)}{\rho}$				Date.	$P-P_0$	$\frac{\alpha(\rho)}{\rho}$			
		Ariel.	Umbriel.	Titania.	Oberon.			Ariel.	Umbriel.	Titania.	Oberon.
	°	″	″	″	″		°	″	″	″	″
Apr. 28	−0.4	13.0	18.0	29.6	39.6	Aug. 26	0.0	13.9	19.4	31.8	42.5
May 3	0.4	13.0	18.1	29.7	39.8	31	0.0	13.9	19.4	31.8	42.5
8	0.5	13.1	18.2	29.8	39.9	Sept. 5	+0.1	13.9	19.3	31.7	42.4
13	0.5	13.1	18.3	30.0	40.1	10	0.1	13.9	19.3	31.7	42.4
18	0.5	13.2	18.3	30.1	40.2	15	0.2	13.8	19.3	31.6	42.3
23	−0.5	13.2	18.4	30.2	40.4	20	+0.2	13.8	19.2	31.6	42.2
28	0.5	13.3	18.5	30.3	40.6	25	0.2	13.8	19.2	31.5	42.1
June 2	0.6	13.3	18.6	30.5	40.7	30	0.3	13.7	19.2	31.4	42.0
7	0.6	13.4	18.6	30.6	40.9	Oct. 5	0.3	13.7	19.1	31.3	41.9
12	0.6	13.4	18.7	30.7	41.1	10	0.3	13.7	19.0	31.2	41.8
17	−0.5	13.5	18.8	30.8	41.2	15	+0.4	13.6	19.0	31.1	41.6
22	0.5	13.5	18.9	31.0	41.4	20	0.4	13.6	18.9	31.0	41.5
27	0.5	13.6	18.9	31.1	41.6	25	0.4	13.5	18.8	30.9	41.3
July 2	0.5	13.6	19.0	31.2	41.7	30	0.4	13.5	18.8	30.8	41.1
7	0.5	13.7	19.1	31.3	41.8	Nov. 4	0.4	13.4	18.7	30.6	41.0
12	−0.4	13.7	19.1	31.4	42.0	9	+0.4	13.3	18.6	30.5	40.8
17	0.4	13.8	19.2	31.5	42.1	14	0.4	13.3	18.5	30.4	40.6
22	0.4	13.8	19.2	31.5	42.2	19	0.4	13.2	18.4	30.2	40.4
27	0.3	13.8	19.3	31.6	42.3	24	0.4	13.2	18.4	30.1	40.3
Aug. 1	0.3	13.9	19.3	31.7	42.3	29	0.4	13.1	18.3	30.0	40.1
6	−0.2	13.9	19.3	31.7	42.4	Dec. 4	+0.4	13.1	18.2	29.9	39.9
11	0.2	13.9	19.3	31.7	42.4	9	0.3	13.0	18.1	29.7	39.8
16	0.1	13.9	19.4	31.8	42.5	14	0.3	13.0	18.1	29.6	39.6
21	−0.1	13.9	19.4	31.8	42.5	19	+0.2	12.9	18.0	29.5	39.5

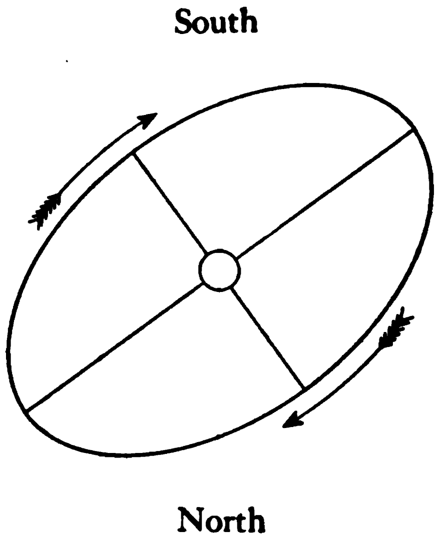
SATELLITE OF NEPTUNE, 1919.

Time from Eastern Elongation.	p^1	F	Time from Eastern Elongation.	p^1	F	Date.	$P-P_0$	$\frac{\alpha(\rho)}{\rho}$	Date.	$P-P_0$	$\frac{\alpha(\rho)}{\rho}$
d h	°		d h	°			°	″		°	″
0 0	124.8	1.000	3 0	302.5	0.999	Jan. 1	+0.8	16.7	May 1	−1.4	16.2
0 3	120.1	0.994	3 3	297.7	0.988	6	0.7	16.7	6	1.4	16.2
0 6	115.2	0.978	3 6	292.7	0.966	11	0.5	16.8	11	1.3	16.1
0 9	110.1	0.952	3 9	287.5	0.935	16	0.4	16.8	16	1.2	16.1
0 12	104.7	0.916	3 12	281.8	0.896	21	0.3	16.8	21	−1.2	16.0
0 15	98.8	0.874	3 15	275.6	0.850	26	+0.1	16.8	Oct. 3	+3.2	16.0
0 18	92.2	0.825	3 18	268.7	0.801	31	0.0	16.8	8	3.3	16.0
0 21	84.8	0.775	3 21	260.8	0.750	Feb. 5	−0.2	16.8	13	3.4	16.0
1 0	76.4	0.725	4 0	251.8	0.702	10	0.3	16.8	18	3.5	16.1
1 3	66.7	0.680	4 3	241.6	0.661	15	0.5	16.8	23	3.6	16.1
1 6	55.9	0.645	4 6	230.2	0.632	20	−0.6	16.7	28	+3.6	16.2
1 9	44.1	0.623	4 9	218.0	0.619	25	0.7	16.7	Nov. 2	3.7	16.2
1 12	31.8	0.619	4 12	205.7	0.623	Mar. 2	0.9	16.7	7	3.7	16.3
1 15	19.6	0.632	4 15	193.9	0.644	7	1.0	16.7	12	3.7	16.3
1 18	8.2	0.661	4 18	183.0	0.680	12	1.1	16.6	17	3.7	16.4
1 21	358.0	0.701	4 21	173.4	0.724	17	−1.2	16.6	22	+3.7	16.4
2 0	348.9	0.749	5 0	164.9	0.774	22	1.3	16.6	27	3.7	16.4
2 3	341.0	0.800	5 3	157.5	0.825	27	1.3	16.5	Dec. 2	3.6	16.5
2 6	334.1	0.850	5 6	150.9	0.873	Apr. 1	1.4	16.5	7	3.6	16.5
2 9	327.8	0.895	5 9	145.0	0.916	6	1.4	16.4	12	3.5	16.6
2 12	322.2	0.935	5 12	139.6	0.951	11	−1.5	16.4	17	+3.4	16.6
2 15	317.0	0.966	5 15	134.5	0.978	16	1.5	16.3	22	3.3	16.6
2 18	312.0	0.988	5 18	129.6	0.994	21	1.5	16.3	27	3.2	16.7
2 21	307.2	0.999	5 21	124.9	1.000	26	−1.5	16.3	32	+3.1	16.7

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F\frac{\alpha(\rho)}{\rho}$.

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE AT DATE OF OPPOSITION, JANUARY 28, 1919, AS SEEN IN AN INVERTING TELESCOPE.



Date.		Position Angle of Apsis.	Apparent Distance at Apsis.
		°	″
Jan.	21	125.1	16.8
May	1	123.4	16.2
Oct.	12	128.2	16.0
Dec.	31	128.0	16.7

GREENWICH MEAN TIME OF GREATEST ELONGATION.

East.			West.			East.			West.			East.			West.		
	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	6	12.7	Jan.	9	11.2	Mar.	29	20.3	Apr.	1	18.8	Oct.	15	13.8	Oct.	18	12.2
	12	9.8		15	8.3	Apr.	4	17.4		7	15.9		21	10.7		24	9.2
	18	6.9		21	5.5		10	14.4		13	13.0		27	7.7		30	6.2
	24	4.0		27	2.6		16	11.5		19	10.0	Nov.	2	4.8	Nov.	5	3.3
	30	1.2	Feb.	1	23.7		22	8.6		25	7.1		8	1.8		11	0.3
Feb.	4	22.3		7	20.8		28	5.6	May	1	4.1		13	22.8		16	21.3
	10	19.4		13	17.9	May	4	2.7		7	1.2		19	19.8		22	18.3
	16	16.5		19	15.1		9	23.7		12	22.2		25	16.9		28	15.4
	22	13.6		25	12.2		15	20.7		18	19.2	Dec.	1	13.9	Dec.	4	12.4
	28	10.8	Mar.	3	9.3		21	17.7		24	16.2		7	11.0		10	9.5
Mar.	6	7.9		9	6.4		27	14.7		30	13.2		13	8.0		16	6.6
	12	5.0		15	3.5	June	2	11.7	June	5	10.2		19	5.1		22	3.7
	18	2.1		21	0.6	. . . . .			. . . . .				25	2.2		28	0.8
	23	23.2		26	21.7	Oct.	9	16.8	Oct.	12	15.3		30	23.3		33	21.9

In the above diagram the central circle represents the planet.
The sidereal period of the satellite of Neptune is $5^d\ 21^h.044$.

GREENWICH MEAN TIME.

PLANETARY CONFIGURATIONS.

	d	h	m				°	′
Jan.	1	17	–	☍ ♃ ☉				
	2	17	4	☌ ♀ ☾	. . . .	♀	– 4	28
	2	21	–	⊕	in Perihelion.			
	4	7	54	☌ ♂ ☾	. . . .	♂	– 5	57
	5	7	51	☌ ♅ ☾	. . . .	♅	– 6	6
	6	6	–	♀	in Aphelion.			
	7	15	–	☿	Greatest elong. W.		23	13
	8	0	–	♂	in Perihelion.			
	14	16	50	☌ ♃ ☾	. . . .	♃	+ 2	24
	16	22	6	☌ ♆ ☾	. . . .	♆	+ 4	22
	18	10	27	☌ ♄ ☾	. . . .	♄	+ 6	50
	19	8	–	☿ in ☋				
	22	1	–	☌ ♂ ♅	. . . .	♂	– 0	22
	28	9	–	☍ ♆ ☉				
	28	20	–	♀	Greatest Hel. Lat. S.			
	29	14	–	☿	in Aphelion.			
	30	6	4	☌ ☿ ☾	. . . .	☿	– 4	48
	30	14	–	☌ ♀ ♅	. . . .	♀	– 0	52
Feb.	1	17	44	☌ ♅ ☾	. . . .	♅	– 6	1
	1	22	41	☌ ♀ ☾	. . . .	♀	– 6	58
	2	8	9	☌ ♂ ☾	. . . .	♂	– 6	28
	10	19	14	☌ ♃ ☾	. . . .	♃	+ 2	20
	13	2	–	☌ ♀ ♂	. . . .	♀	– 0	35
	13	4	57	☌ ♆ ☾	. . . .	♆	+ 4	20
	14	2	–	☍ ♄ ☉				
	14	15	2	☌ ♄ ☾	. . . .	♄	+ 6	45
	16	22	–	☌ ♅ ☉				
	18	22	–	☿	Greatest Hel. Lat. S.			
	19	15	–	☌ ☿ ♅	. . . .	☿	– 1	26
	23	9	–	☌ ☿ ☉	Superior.			
Mar.	1	6	5	☌ ♅ ☾	. . . .	♅	– 6	3
	2	4	–	♃	Stationary.			
	2	15	4	☌ ☿ ☾	. . . .	☿	– 6	37
	3	6	28	☌ ♂ ☾	. . . .	♂	– 5	51
	3	20	46	☌ ♀ ☾	. . . .	♀	– 5	43
	9	23	–	☿	in ☊			
	9	23	46	☌ ♃ ☾	. . . .	♃	+ 2	35
	11	7	–	☌ ☿ ♂	. . . .	☿	+ 0	59
	12	10	5	☌ ♆ ☾	. . . .	♆	+ 4	27
	13	17	54	☌ ♄ ☾	. . . .	♄	+ 6	47
	14	13	–	☿	in Perihelion.			
	21	2	–	☿	Greatest elong. E.		18	35
	21	4	19	☉	enters ♈, Spring com.			
	24	20	–	☿	Greatest Hel. Lat. N.			
	26	3	–	♀	in ☊			
	28	2	–	□ ♃ ☉				
	28	17	–	☿	Stationary.			
	28	19	13	☌ ♅ ☾	. . . .	♅	– 6	11
Apr.	1	3	3	☌ ♂ ☾	. . . .	♂	– 4	17
	1	3	24	☌ ☿ ☾	. . . .	☿	– 0	13
	1	8	–	☌ ☿ ♂	. . . .	☿	+ 4	2
	2	14	3	☌ ♀ ☾	. . . .	♀	– 1	36
Apr.	6	9	5	☌ ♃ ☾	. . . .	♃	+ 3	0
	7	19	–	☌ ☿ ☉	Inferior.			
	8	15	2	☌ ♆ ☾	. . . .	♆	+ 4	39
	9	21	11	☌ ♄ ☾	. . . .	♄	+ 6	54
	17	7	–	☿	in ☋			
	17	11	–	♆	Stationary.			
	20	5	–	☿	Stationary.			
	23	15	–	♄	Stationary.			
	25	6	57	☌ ♅ ☾	. . . .	♅	– 6	23
	27	9	–	□ ♆ ☉				
	27	13	–	☿	in Aphelion.			
	28	4	0	☌ ☿ ☾	. . . .	☿	– 6	47
	28	14	–	♀	in Perihelion.			
	29	22	25	☌ ♂ ☾	. . . .	♂	– 2	12
May	2	8	16	☌ ♀ ☾	. . . .	♀	+ 3	5
	3	23	42	☌ ♃ ☾	. . . .	♃	+ 3	29
	5	19	–	☿	Greatest elong. W.		26	36
	5	21	44	☌ ♆ ☾	. . . .	♆	+ 4	49
	7	3	16	☌ ♄ ☾	. . . .	♄	+ 7	0
	9	7	–	☌ ♂ ☉				
	10	20	–	♂	in ☊			
	13	1	–	□ ♄ ☉				
	17	22	–	☿	Greatest Hel. Lat. S.			
	20	15	–	♀	Greatest Hel. Lat. N.			
	22	15	45	☌ ♅ ☾	. . . .	♅	– 6	28
	23	8	–	□ ♅ ☉				
	25	11	–	☌ ♀ ♃	. . . .	♀	+ 2	7
	27	23	36	☌ ☿ ☾	. . . .	☿	– 2	50
	28	17	3	☌ ♂ ☾	. . . .	♂	+ 0	1
	29	–	–	☉	Tot. ecl. invis. at Wash.			
	31	18	16	☌ ♃ ☾	. . . .	♃	+ 3	55
June	1	5	38	☌ ♀ ☾	. . . .	♀	+ 6	32
	2	7	0	☌ ♆ ☾	. . . .	♆	+ 4	52
	3	13	17	☌ ♄ ☾	. . . .	♄	+ 7	2
	5	13	–	☌ ☿ ♂	. . . .	☿	– 0	21
	5	22	–	☿	in ☊			
	6	16	–	♅	Stationary.			
	10	13	–	☿	in Perihelion.			
	11	2	–	☌ ☿ ☉	Superior.			
	14	6	–	☌ ♀ ♆	. . . .	♀	+ 2	19
	18	21	39	☌ ♅ ☾	. . . .	♅	– 6	26
	20	19	–	☿	Greatest Hel. Lat. N.			
	21	23	54	☉	enters ♋, Summer com.			
	26	11	14	☌ ♂ ☾	. . . .	♂	+ 2	7
	26	19	–	☌ ☿ ♃	. . . .	☿	+ 1	38
	28	14	44	☌ ♃ ☾	. . . .	♃	+ 4	20
	28	20	32	☌ ☿ ☾	. . . .	☿	+ 6	6
	29	18	3	☌ ♆ ☾	. . . .	♆	+ 4	51
July	1	0	25	☌ ♀ ☾	. . . .	♀	+ 6	53
	1	2	35	☌ ♄ ☾	. . . .	♄	+ 6	58
	2	9	–	☌ ♀ ♄	. . . .	♀	– 0	10
	2	22	–	⊕	in Aphelion.			

GREENWICH MEAN TIME.

PLANETARY CONFIGURATIONS.

	d	h	m			°	′
July	4	19	–	♀	Greatest elong. E.	45	28
	6	15	–	☌ ☿ ♆	. . . . ☿ +	1	16
	14	6	–	☿	in ☋		
	15	16	–	♀	in ☋		
	16	2	7	☌ ♅ ☾	. . . . ♅ –	6	18
	18	5	–	☿	Greatest elong. E.	26	47
	20	14	–	☌ ♃ ☉			
	24	12	–	☿	in Aphelion.		
	25	5	2	☌ ♂ ☾	. . . . ♂ +	4	0
	26	11	13	☌ ♃ ☾	. . . . ♃ +	4	43
	27	5	24	☌ ♆ ☾	. . . . ♆ +	4	49
	28	15	8	☌ ☿ ☾	. . . . ☿ +	2	14
	28	17	36	☌ ♄ ☾	. . . . ♄ +	6	53
	30	5	0	☌ ♀ ☾	. . . . ♀ +	3	7
	31	7	–	☿	Stationary.		
Aug.	1	22	–	☌ ♆ ☉			
	7	13	–	♀	Greatest Brilliancy.		
	12	7	8	☌ ♅ ☾	. . . . ♅ –	6	12
	13	21	–	☿	Greatest Hel. Lat. S.		
	15	1	–	☌ ☿ ☉	Inferior.		
	19	0	–	♀	in Aphelion.		
	20	3	–	♀	Stationary.		
	22	22	15	☌ ♂ ☾	. . . . ♂ +	5	32
	23	6	17	☌ ♃ ☾	. . . . ♃ +	5	8
	23	10	–	☍ ♅ ☉			
	23	15	33	☌ ♆ ☾	. . . . ♆ +	4	53
	24	2	28	☌ ☿ ☾	. . . . ☿ +	2	29
	24	5	–	☿	Stationary.		
	25	8	38	☌ ♄ ☾	. . . . ♄ +	6	51
	25	12	–	☌ ♄ ☉			
	27	0	34	☌ ♀ ☾	. . . . ♀ –	2	47
Sept.	1	8	–	☿	Greatest elong. W.	18	8
	1	21	–	☿	in ☊		
	1	21	–	☌ ♂ ♃	. . . . ♂ +	0	41
	6	12	–	☿	in Perihelion.		
	7	12	–	☌ ♂ ♆	. . . . ♂ +	1	12
	8	13	57	☌ ♅ ☾	. . . . ♅ –	6	12
	10	13	–	♀	Greatest Hel. Lat. S.		
	10	20	–	☌ ☿ ♄	. . . . ☿ +	0	7
	12	15	–	☌ ♀ ☉	Inferior.		
	15	21	–	☌ ☿ ♀	. . . . ☿ +	11	17
	16	19	–	☿	Greatest Hel. Lat. N.		
	19	22	58	☌ ♃ ☾	. . . . ♃ +	5	33
	19	23	45	☌ ♆ ☾	. . . . ♆ +	5	3
	20	14	33	☌ ♂ ☾	. . . . ♂ +	6	35
	21	22	23	☌ ♄ ☾	. . . . ♄ +	6	55
	22	7	29	☌ ♀ ☾	. . . . ♀ –	3	18
	22	16	–	☌ ♃ ♆	. . . . ♃ +	0	32
	23	14	36	☉	enters ♎, Autumn com.		
	23	16	20	☌ ☿ ☾	. . . . ☿ +	6	21
	26	20	–	☌ ☿ ☉	Superior.		
Oct.	1	22	–	♀	Stationary.		
Oct.	5	22	27	☌ ♅ ☾	. . . . ♅ –	6	19
	10	6	–	☿	in ☋		
	17	6	24	☌ ♆ ☾	. . . . ♆ +	5	15
	17	12	54	☌ ♃ ☾	. . . . ♃ +	5	56
	19	5	38	☌ ♂ ☾	. . . . ♂ +	7	0
	19	10	14	☌ ♄ ☾	. . . . ♄ +	7	3
	19	18	–	♀	Greatest Brilliancy.		
	19	21	4	☌ ♀ ☾	. . . . ♀ +	2	27
	20	12	–	☿	in Aphelion.		
	24	0	–	☌ ♂ ♄	. . . . ♂ –	0	5
	24	22	11	☌ ☿ ☾	. . . . ☿ –	1	3
Nov.	2	7	21	☌ ♅ ☾	. . . . ♅ –	6	25
	4	12	–	□ ♆ ☉			
	5	20	–	♀	in ☊		
	7	–	–	☾	Par. ecl. vis. at Wash.		
	7	19	–	♅	Stationary.		
	9	20	–	☿	Greatest Hel. Lat. S.		
	10	3	–	□ ♃ ☉			
	12	0	–	♂	Greatest Hel. Lat. N.		
	12	9	–	☿	Greatest elong. E.	22	48
	13	13	1	☌ ♆ ☾	. . . . ♆ +	5	22
	14	0	17	☌ ♃ ☾	. . . . ♃ +	6	11
	14	12	–	♆	Stationary.		
	15	20	17	☌ ♄ ☾	. . . . ♄ +	7	11
	16	19	19	☌ ♂ ☾	. . . . ♂ +	6	45
	18	1	28	☌ ♀ ☾	. . . . ♀ +	5	26
	20	17	–	□ ♅ ☉			
	22	–	–	☉	Ann. ecl. vis. as par. at W.		
	22	12	–	☿	Stationary.		
	23	10	–	♀	Greatest elong. W.	46	44
	23	16	34	☌ ☿ ☾	. . . . ☿ –	3	33
	28	20	–	☿	in ☊		
	29	15	26	☌ ♅ ☾	. . . . ♅ –	6	25
Dec.	2	11	–	☌ ☿ ☉	Inferior.		
	3	11	–	☿	in Perihelion.		
	4	1	–	□ ♄ ☉			
	5	7	–	♃	Stationary.		
	9	12	–	♀	in Perihelion.		
	10	21	5	☌ ♆ ☾	. . . . ♆ +	5	19
	11	9	29	☌ ♃ ☾	. . . . ♃ +	6	16
	12	4	–	☿	Stationary.		
	13	5	15	☌ ♄ ☾	. . . . ♄ +	7	13
	13	18	–	☿	Greatest Hel. Lat. N.		
	15	7	26	☌ ♂ ☾	. . . . ♂ +	5	58
	17	18	–	♂	in Aphelion.		
	17	21	27	☌ ♀ ☾	. . . . ♀ +	4	0
	19	23	29	☌ ☿ ☾	. . . . ☿ +	1	16
	21	3	–	☿	Greatest elong. W.	21	47
	22	9	27	☉	enters ♑, Winter com.		
	23	19	–	♄	Stationary.		
	26	22	45	☌ ♅ ☾	. . . . ♅ –	6	15
	31	8	–	♀	Greatest Hel. Lat. N.		

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.	Reduction fm Greenwich to Local S.T.M.N.
		° ′ ″	′ ″			h m s	s
1	Abbadia, France	+43 22 52.2	−11 34.4	69	9.999317	+ 0 7 0.1	+ 1.15
2	Adelaide, S. Australia	−34 55 38.0 a	+10 52.4	41 b	9.999526	− 9 14 20.07 a	− 91.06
3	Adelaide, S. Australia	−34 55 37.4 c	+10 52.4	. . .	9.999523	− 9 14 20.17 c	− 91.06
4	Albany, N. Y.	+42 39 12.7 a	−11 33.1	70 a	9.999336	+ 4 55 7.12 a	+ 48.48
5	Albany, N. Y.	+42 39 49.5 a	−11 33.1	52	9.999335	+ 4 54 59.97 a	+ 48.46
6	Algiers, Algeria	+36 47 50	−11 6.7	342	9.999501	− 0 12 8.38	− 1.99
7	Allegheny, Pa.	+40 28 58.1 d	−11 26.7	370 d	9.999411	+ 5 20 5.39 d	+ 52.58
8	Allegheny, Pa.	+40 27 41.6	−11 26.6	. . .	9.999387	+ 5 20 2.93	+ 52.58
9	Amherst, Mass.	+42 21 56.5 e	−11 32.5	110 e	9.999346	+ 4 50 5.93 e	+ 47.66
10	Amherst, Mass.	+42 22 17.1 f	−11 32.5	. . .	9.999338	+ 4 50 4.67 f	+ 47.65
11	Ann Arbor, Mich.	+42 16 48.7 a	−11 32.3	282 a	9.999360	+ 5 34 55.27 a	+ 55.02
12	Appleton, Wis.	+44 15 39.2 g	−11 35.4	242	9.999307	+ 5 53 35.92 g	+ 58.09
13	Arcetri, Italy	+43 45 14.4	−11 34.9	184	9.999316	− 0 45 1.30	− 7.40
14	Arequipa, Peru	−16 22 28.0 h	+ 6 15.2	2451 h	0.000052	+ 4 46 11.73 h	+ 47.02
15	Armagh, Ireland	+54 21 12.7 c	−10 59.6	61 c	9.999040	+ 0 26 35.4 c	+ 4.37
16	Athens, Greece	+37 58 19.7 i	−11 14.3	107 i	9.999456	− 1 34 53 i	− 15.59
17	Baltimore, Md.	+39 17 52.0 j	−11 21.5	36 j	9.999418	+ 5 6 29.1 j	+ 50.35
18	Bamberg, Bavaria	+49 53 6.0 c	−11 26.0	299 c	9.999167	− 0 43 33.57 c	− 7.16
19	Barcelona, Spain	+41 25 18	−11 30.0	420	9.999391	− 0 8 28.0	− 1.39
20	Beloit, Wis.	+42 30 8.4	−11 32.8	. . .	9.999335	+ 5 56 7.4	+ 58.50
21	Bergedorf, Germany	+53 28 46.2	−11 6.1	35	9.999060	− 0 40 57.74	− 6.73
22	Berkeley, Cal.	+37 52 23.6	−11 13.7	97	9.999458	+ 8 9 2.72	+ 80.34
23	Berlin, Prussia	+52 30 16.7 k	−11 12.5	47 k	9.999085	− 0 53 34.80 k	− 8.80
24	Berlin, Prussia	+52 31 13.1	−11 12.4	. . .	9.999081	− 0 53 34.41	− 8.80
25	Berlin, Prussia	+52 31 30.7	−11 12.4	. . .	9.999081	− 0 53 27.40	− 8.78
26	Berlin, Prussia	+52 29 7	−11 12.6	38	9.999084	− 0 53 54.2	− 8.86
27	Berne, Switzerland	+46 57 8.7	−11 34.2	573	9.999260	− 0 29 45.70 a	− 4.89
28	Besançon, France	+47 14 59.0	−11 33.7	312	9.999235	− 0 23 57.13	− 3.93
29	Birr Castle, Ireland	+53 5 47	−11 8.7	56	9.999071	+ 0 31 40.9	+ 5.20
30	Bloomington, Ind.	+39 9 56 d	−11 20.8	238 d	9.999435	+ 5 46 5 d	+ 56.85
31	Bogota, Colombia	+ 4 35 55.2 c	− 1 50.8	2634	0.000170	+ 4 56 23.5	+ 48.69
32	Bombay (Colaba), India	+18 53 36.2 c	− 7 5.1	14 c	9.999849	− 4 51 15.72 c	− 47.85
33	Bonn, Prussia	+50 43 45.0 k	−11 22.3	62 l	9.999130	− 0 28 23.17 k	− 4.66
34	Bordeaux (Floirac), France	+44 50 7.2 a	−11 35.6	73	9.999281	+ 0 2 5.51 a	+ 0.34
35	Boston, Mass.	+42 20 58 m	−11 32.5	31 m	9.999341	+ 4 44 19.1 m	+ 46.71
36	Boston, Mass.	+42 21 32.5	−11 32.5	48	9.999342	+ 4 44 15.0	+ 46.70
37	Bothkamp, Prussia	+54 12 9.6 n	−11 0.8	32 n	9.999042	− 0 40 31.02 n	− 6.66
38	Bremen, Germany	+53 4 36	−11 8.8	. . .	9.999067	− 0 35 15	− 5.79
39	Breslau, Prussia	+51 6 55.8 k	−11 20.4	147 k	9.999126	− 1 8 8.72 k	− 11.20
40	Brisbane, Queensland	−27 28 0.0	+ 9 28.3	. . .	9.999691	−10 12 6.17	−100.55
41	Brussels (Uccle), Belgium	+50 47 55.5 a	−11 21.9	105 a	9.999131	− 0 17 26.05 a	− 2.86
42	Brussels, Belgium	+50 51 10.6 c	−11 21.7	. . .	9.999123	− 0 17 28.02 c	− 2.87
43	Budapest, Hungary	+47 29 34.7 c	−11 33.2	131 c	9.999217	− 1 16 15.3 c	− 12.53
44	Cambridge, England	+52 12 51.6	−11 14.3	28	9.999091	− 0 0 22.75	− 0.06
45	Cambridge, Mass.	+42 22 47.6 o	−11 32.6	24	9.999340	+ 4 44 31.05 o	+ 46.74
46	Cape of Good Hope	−33 56 3.5 p	+10 43.6	13 p	9.999548	− 1 13 54.76 p	− 12.14
47	Carloforte, Sardinia	+39 8 8.9 q	−11 20.7	18 q	9.999421	− 0 33 14.9 q	− 5.46
48	Catania, Sicily	+37 30 13.2 c	−11 11.4	49 c	9.999464	− 1 0 20.70 c	− 9.91
49	Charkow, Russia	+50 0 9.9 a	−11 25.5	138 r	9.999153	− 2 24 55.75 a	− 23.81
50	Charlottesville, Va.	+38 2 1.2 e	−11 14.6	259 e	9.999465	+ 5 14 5.33 e	+ 51.60

a Meridian circle.
b Standard barometer.
c Transit instrument.
d Transit instrument pier.
e Center of large dome.
f Center of dome tower.
g Center of dome.
h Transit pier.
i Cercle Syngros.
j Center of instrument house.
k Center of observatory.
l Floor of meridian room.
m Foot of pillar of 7-in. equatorial.
n Cube of equatorial.
o Dome of 15-in. equatorial.
p 8-in. meridian circle.
q Zenith telescope.
r Barometer in meridian room.

No.	Authority for—		Description.
	Latitude.	Longitude.	
1	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Obs. Paris Acad. of Sci., Hendaye.
2	Letter from Govt. Astronomer, 1913.	Letter from Govt. Astronomer, 1913.	Govt. Obs., since 1884.
3	Letter from Govt. Astronomer, 1913.	Letter from Govt. Astronomer, 1913.	Govt. Obs., before 1884.
4	Letter from Director, 1913.	Letter from Director, 1913.	Dudley Obs., since 1893.
5	Letter from Director, 1913.	Letter from Director, 1913.	Dudley Obs., before 1893.
6	*Les Obs. Astron.*, Bruxelles, 1907.	*Astron. Nach.*, Nr. 3993, 1905.	At Bouzaréah. Old Obs. 3′.8 S., 8^{s} E.
7	*Publications* of Obs., 1909.	*Publications* of Obs., 1909.	[a] Obs. Western Univ. of Pa., since 1905.
8	Letter from Director, 1897.	Letter from Director, 1897.	Obs. Western Univ. of Pa., before 1905.
9	Letter from Director, 1913.	Letter from Director, 1913.	Amherst College Obs., since 1903.
10	Letter from Director, 1913.	Letter from Director, 1913.	Lawrence Obs., before 1903.
11	*Publications* of Obs., 1915.	*Publications* of Obs., 1915.	Detroit Obs., Univ. of Mich.
12	See footnote (b).	See footnote (b).	Underwood Obs., Lawrence College.
13	*Pubbl. dell'Osserv.*, 1900.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Observatory.
14	*Harvard Annals*, 1903.	*Harvard Annals*, 1903.	Branch of Harvard Coll. Obs.
15	*Armagh Catalogue of Stars*, 1840.	*Armagh Catalogue of Stars*, 1840.	Armagh Observatory.
16	*Annales de l'Obs.*, 1910.	Letter from Director, 1913.	[c] National Observatory.
17	Letter from Director, 1913.	Letter from Director, 1913.	Johns Hopkins Univ. Obs.
18	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Remeis Observatory.
19	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Fabra Obs., Acad. of Sci. and Arts.
20	Letter from Director, 1897.	Letter from Director, 1897.	Smith Obs., Beloit College.
21	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Hamburg Obs., since 1909.
22	Letter from Director, 1897.	Letter from Director, 1897.	Students' Obs., Univ. of Cal.
23	*Astron. Nach.*, Nr. 3545, 1898.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Obs., since 1835.
24	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs., before 1835.
25	*Astron. Nach.*, Nr. 3170, 1893.	*Astron. Nach.*, Nr. 3170, 1893.	Urania Observatory.
26	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Treptow Observatory.
27	*Berliner Jahrbuch.*	*Astron. Nach.*, Nr. 3202, 1893.	Observatory, Cantonal Univ.
28	*Astron. Nach.*, Nr. 2805, 1887.	*Astron. Nach.*, Nr. 2805, 1887.	National Observatory.
29	British *Nautical Almanac*.	British *Nautical Almanac*.	Private Obs. of Earl of Rosse.
30	Letter from Director, 1913.	Letter from Director, 1913.	Kirkwood Obs., Univ. of Ind.
31	Letter from Director, 1913.	Letter from Director, 1913.	National Observatory.
32	Letter from Director, 1913.	Letter from Director, 1913.	Government Observatory.
33	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Observatory.
34	Letter from Director, 1897.	*Annales de l'Obs.*, 1885.	Obs., Univ. of Bordeaux.
35	Letter from Director, 1909.	Letter from Director, 1909.	Boston Univ. Obs., since 1908.
36	Letter from Director, 1895.	Letter from Director, 1895.	Boston Univ. Obs., before 1908.
37	*Beob. zu Bothkamp*, 1872.	Letter from Director, 1913.	Obs. of Herr von Bülow.
38	*Astron. Nach.*, Nr. 15, 1822.	*Astron. Nach.*, Nr. 15, 1822.	Formerly Olber's Obs.
39	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Royal University Obs.
40	British *Nautical Almanac*.	[e] British *Nautical Almanac*.	Brisbane Observatory.
41	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs., since 1891.
42	*Annales de l'Obs.*, 1857.	Letter from Director, 1913.	Royal Obs., before 1891.
43	*Astron. Nach.*, Nr. 2752, 1886.	*Astron. Nach.*, Nr. 2752, 1886.	University Observatory.
44	Letter from Director, 1879.	Letter from Director, 1879.	University Observatory.
45	*Harvard Annals*, 1887.	*U. S. C. and G. S. Report*, 1897.	Harvard College Obs.
46	*Cape Gen. Catalogue of Stars*, 1885.	*Monthly Notices, R. A. S.*, Nov. 1908.	Royal Observatory.
47	See footnote (d).	Letter from Director, 1913.	International Lat. Obs.
48	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs. of Catania and Etna.
49	*Annales de l'Obs.*, 1904.	*Annales de l'Obs.*, 1904.	University Observatory.
50	Letter from Director, 1913.	Letter from Director, 1913.	Leander McCormick Obs., Univ. Va.

[a] Name of Western Univ. of Pa. changed in 1908; now the Univ. of Pittsburgh.
[b] *Professional Papers, Corps of Engineers, U. S. A.*, 1882.
[c] Old meridian circle 0″.4 S., 0^{s}.1 W. of Cercle Syngros.
[d] *Resultate des Internationalen Breitendienstes*, 1900-1908.
[e] With the new value of the longitude of Sydney.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T. M.S.
		° ′ ″	′ ″			h m s	s
51	Chicago, Ill.	+41 50 1.0	−11 31.2	. . .	9.999352	+5 50 26.84	+57.57
52	Christiania, Norway .	+59 54 44.0[a]	−10 4.6	25[a]	9.998908	−0 42 53.50[e]	− 7.05
53	Cincinnati, Ohio . . .	+39 8 19.8[b]	−11 20.7	247[b]	9.999437	+5 37 41.40[b]	+55.47
54	Cincinnati, Ohio . . .	+39 6 26.5	−11 20.5	. . .	9.999421	+5 37 59.00	+55.52
55	Cleveland, Ohio . . .	+41 30 14.5[c]	−11 30.2	215[c]	9.999375	+5 26 25.86[c]	+53.62
56	Clinton, N. Y. . . .	+43 3 17.0	−11 33.9	276	9.999340	+5 1 37.45	+49.55
57	Coimbra, Portugal . .	+40 12 24.5	−11 25.6	99	9.999400	+0 33 43.1	+ 5.54
58	Columbia, Mo. . . .	+38 56 51.7[d]	−11 19.7	225[e]	9.999440	+6 9 18.33[d]	+60.67
59	Columbus, Ohio . . .	+39 59 50.4[d]	−11 24.7	233[d]	9.999414	+5 32 2.00[d]	+54.55
60	Copenhagen Denmark .	+55 41 12.6	−10 48.6	14	9.999005	−0 50 18.69[f]	− 8.26
61	Cordova, Arg. Rep. . .	−31 25 15.5[g]	+10 18.0	434[g]	9.999634	+4 16 48.22[g]	+42.19
62	Cracow Austria . . .	+50 3 52.0[a]	−11 25.2	221[a]	9.999157	−1 19 50.27[e]	−13.12
63	Danzig, Prussia . . .	+54 21 18.0	−10 59.6	3	9.999036	−1 14 39.6	−12.26
64	Dehra Dun, India . .	+30 18 51.8[h]	−10 5.3	681[h]	9.999676	−5 12 11.76[h]	−51.29
65	Denver, Colo.	+39 40 36.4[a]	−11 23.3	1644[i]	9.999518	+6 59 47.72[e]	+68.96
66	Des Moines, Iowa . .	+41 36 0	−11 30.5	296	9.999378	+6 14 30.56	+61.52
67	Dorpat (Jurjew), Russia	+58 22 47.2[a]	−10 22.1	67[a]	9.998945	−1 46 53.22[e]	−17.56
68	Dresden, Saxony . .	+51 2 16.8	−11 20.8	121	9.999126	−0 54 54.74	− 9.02
69	Dublin, Ireland . . .	+53 23 13.1[a]	−11 6.7	86[a]	9.999066	+0 25 21.1 [e]	+ 4.16
70	Dun Echt, Scotland .	+57 9 36	−10 34.8	141	9.998979	+0 9 40.0	+ 1.59
71	Durham, England . .	+54 46 6.2[j]	−10 56.4	107[k]	9.999033	+0 6 19.75[j]	+ 1.04
72	Dusseldorf, Prussia . .	+51 12 25.0[l]	−11 19.9	46[l]	9.999117	−0 27 2.69[l]	− 4.44
73	Edinburgh, Scotland .	+55 55 30.0[a]	−10 46.5	134[m]	9.999007	+0 12 44.22[e]	+ 2.09
74	Edinburgh, Scotland .	+55 57 23.2[n]	−10 46.2	106[o]	9.998995	+0 12 43.05[n]	+ 2.09
75	Elmira, N. Y. . . .	+42 6 25	−11 31.9	. . .	9.999345	+5 7 13.90	+50.47
76	Evanston, Ill. . . .	+42 3 33.4	−11 31.8	175	9.999358	+5 50 42.3	+57.61
77	Flagstaff, Ariz. . . .	+35 12 30.5	−10 54.7	2210	9.999667	+7 26 44.58	+73.39
78	Gaithersburg, Md. . .	+39 8 13.2[r]	−11 20.7	165	9.999431	+5 8 47.73	+50.73
79	Geneva, N. Y. . . .	+42 52 46.2	−11 33.6	152	9.999336	+5 8 1.00	+50.60
80	Geneva, Switzerland .	+46 11 59.3[a]	−11 35.2	407[a]	9.999268	−0 24 36.61[a]	− 4.04
81	Genoa, Italy	+44 25 9.3[a]	−11 35.5	105	9.999293	−0 35 41.28[a]	− 5.86
82	Georgetown, D. C. . .	+38 54 26.7[b]	−11 19.5	47	9.999429	+5 8 18.26[b]	+50.65
83	Glasgow, Mo.	+39 13 45.6	−11 21.1	227	9.999433	+6 11 18.08	+61.00
84	Glasgow, Scotland . .	+55 52 42.8[a]	−10 46.9	55[p]	9.999003	+0 17 10.55[a]	+ 2.82
85	Gotha, Germany . . .	+50 56 37.9[l]	−11 21.2	322[a]	9.999142	−0 42 50.51[l]	− 7.04
86	Gotha, Germany . . .	+50 56 4.4[j]	−11 21.2	360[j]	9.999145	−0 42 55.09[j]	− 7.05
87	Göttingen, Prussia . .	+51 31 48.1[q]	−11 18.2	161[q]	9.999116	−0 39 46.22[q]	− 6.53
88	Greencastle, Ind. . .	+39 38 46.6[a]	−11 23.1	262[a]	9.999425	+5 47 24.36[a]	+57.07
89	Greenwich, England .	+51 28 38.2[a]	−11 18.5	49[a]	9.999110	0 0 0.00[a]	0.00
90	Hamburg, Germany .	+53 33 6.0	−11 5.6	25	9.999057	−0 39 53.60[a]	− 6.55
91	Hamburg, Germany .	+53 32 51.3[d]	−11 5.6	30[d]	9.999058	−0 39 53.46[d]	− 6.55
92	Hanover, N. H. . . .	+43 42 15.3	−11 34.8	183	9.999317	+4 49 8.02	+47.50
93	Haverford, Pa. . . .	+40 0 40.1[r]	−11 24.8	. . .	9.999398	+5 1 12.70[r]	+49.48
94	Heidelberg, Baden . .	+49 23 55.2[s]	−11 27.8	567[s]	9.999198	−0 34 53.13[s]	− 5.73
95	Heidelberg, Baden . .	+49 23 55.7[t]	−11 27.8	570[t]	9.999198	−0 34 52.96[t]	− 5.73
96	Heidelberg, Baden . .	+49 24 34.3[l]	−11 27.8	126[l]	9.999168	−0 34 46.80[l]	− 5.71
97	Helsingfors, Finland .	+60 9 42.3[a]	−10 1.5	33[a]	9.998903	−1 39 49.10[a]	−16.40
98	Herény, Hungary . .	+47 15 47.4	−11 33.7	229	9.999229	−1 6 24.7	−10.91
99	Hong Kong, China . .	+22 18 13.2[j]	− 8 7.4	33[j]	9.999793	−7 36 41.86[j]	−75.01
100	Iowa City, Iowa . . .	+41 40 0	−11 30.7	183	9.999369	+6 6 6	+60.14

[a] Meridian circle.
[b] Center of dome.
[c] Zenith telescope pier.
[d] Transit pier.
[e] Observatory bench mark.
[f] Center of observatory.
[g] Old meridian circle.
[h] Floor-level of zenith sector pillar.
[i] Main floor.
[j] Transit instrument.
[k] Barometer in transit room.
[l] Equatorial.
[m] Standard barometer.
[n] Point midway between transit instrument and mural circle.
[o] Floor of main building.
[p] Floor of meridian circle room.
[q] Position of meridian circle before 1885.
[r] Zenith telescope.
[s] Repsold meridian circle.
[t] Bruce telescope.

No.	Authority for—		Description.
	Latitude.	Longitude.	
51	U. S. Lake Survey, 1864.	Smithsonian *Report*, 1886.	[a] Dearborn Observatory.
52	*Astron. Nach.*, Nr. 3193, 1893.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
53	*Publications* of the Obs., 1908.	*Astronomical Journal*, 1897.	Cincinnati Obs., since 1873.
54	Letter from Director, 1897.	*Astronomical Journal*, 1854.	Cincinnati Obs., before 1873.
55	Letter from Director, 1913.	Letter from Director, 1913.	Case Obs., Case School of Appl'd Sci.
56	*Astron. Nach.*, Nr. 2553, 1883.	*Astron. Nach.*, Nr. 2553, 1883.	Litchfield Obs., Hamilton College.
57	*Eph. Astron. de Coimbra*, 1889.	*Eph. Astron. de Coimbra*, 1889.	University Observatory.
58	*Trans. Acad. of Sci. of St. Louis*, 1894.	*Trans. Acad. of Sci. of St. Louis*, 1894.	Laws Obs., Univ. of Mo.
59	Letter from Director, 1913.	Letter from Director, 1899.	McMillin Obs., State Univ.
60	British *Nautical Almanac*.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
61	*Resultados del Obs.*, 1887.	*Resultados del Obs.*, 1887.	National Observatory.
62	Letter from Director, 1913.	Letter from Director, 1913.	Imperial and Royal Obs.
63	Letter from Director, 1897.	Letter from Director, 1897.	Obs. of the School of Navigation.
64	*Great Trig. Survey of India*, 1906.	Letter from Supt. of Survey, 1913.	Haig Obs., Trig. Survey of India.
65	Letter from Director, 1913.	Letter from Director, 1913.	Chamberlin Obs., Univ. of Denver.
66	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Drake Univ. Obs.
67	*Publikationen der Sternw.*, 1911.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial University Obs.
68	*Berliner Jahrbuch*.	*Berliner Jahrbuch*.	[b] Baron Engelhardt's Obs.
69	*Trans. Royal Dublin Soc.*, 1889.	*Trans. Royal Irish Acad.*, 1838.	Dunsink Obs., Trinity College.
70	Letter from Royal Astronomer, 1897.	Letter from Royal Astronomer, 1897.	[c] Lord Crawford's Obs.
71	Letter from Director, 1913.	Letter from Director, 1913.	University Observatory.
72	*Astron. Nach.*, Nr. 643, 1848.	Letter from Director, 1913.	Municipal Obs., Bilk.
73	*Monthly Notices, R. A. S.*, 1907.	Letter from Director, 1913.	Royal Obs. since 1895; Blackford Hill.
74	*Monthly Notices, R. A. S.*, 1836.	*Edinburgh Observations*, 1858.	[d] Royal Obs. before 1895; Calton Hill.
75	Letter from Director, 1912.	Letter from Director, 1912.	Elmira College Obs.
76	Letter from Director, 1893.	Letter from Director, 1893.	Dearborn Obs., North Western Univ.
77	British *Nautical Almanac*.	British *Nautical Almanac*.	Lowell Observatory.
78	See footnote (j).	See footnote (k).	International Lat. Obs.
79	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Smith Observatory.
80	*Memoire* par J. Pidoux, 1900.	*Astron. Nach.*, Nr. 3993, 1905.	Municipal Observatory.
81	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Hydrographic Institute.
82	See footnote (e).	See footnote (e).	Georgetown College Obs.
83	*Astron. Nach.*, Nr. 2625, 1884.	*Washington Observations*, 1877.	Morrison Observatory.
84	*First Glasgow Catalogue*, 1870.	*Monthly Notices, R. A. S.*, 1865.	University Observatory.
85	Letter from Director, 1913.	Letter from Director, 1913.	Ducal Obs. since 1857.
86	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Ducal Obs. before 1857.
87	*Astron. Nach.*, Nr. 4428, 1910.	*Astron. Nach.*, Nr. 3993, 1905.	Royal University Obs.
88	Letter from Director, 1912.	Letter from Director, 1912.	McKim Obs., De Pauw Univ.
89	*Greenwich Observations*, 1910.	*Greenwich Observations*, 1910.	[f] Royal Observatory.
90	Letter, Director new Obs., 1913.	*Astron. Nach.*, Nr. 3993, 1905.	[g] Hamburg Observatory before 1909.
91	Letter from Director, 1913.	Letter from Director, 1913.	[h] Imperial Marine Obs.
92	Letter from Director, 1894.	Letter from Director, 1894.	Shattuck Obs., Dartmouth College.
93	*Proc. Amer. Ph. Soc.*, 1883.	*Proc. Amer. Ph. Soc.*, 1883.	Haverford College Obs.
94	Letter from Director, 1913.	Letter from Director, 1913.	Astron. Institute, Königstuhl Obs.
95	*Publik. des Obs., Königstuhl*, 1902.	*Publik. des Obs., Königstuhl*, 1902.	Astrophys. Inst., Königstuhl Obs.
96	*Publik. des Obs., Königstuhl*, 1902.	*Publik. des Obs., Königstuhl*, 1902.	[i] Dr. Wolf's Obs. before 1898.
97	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial Univ. Obs.
98	*Astron. Nach.*, Nr. 2633, 1884.	British *Nautical Almanac*.	Astrophysical Observatory.
99	*Hong Kong Observations*, 1897.	Letter from Director, 1897.	Colonial Observatory.
100	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Obs., Univ. of Iowa.

[a] Transferred to Evanston, Ill., in 1887.
[b] Instruments transferred to Univ. of Kasan in 1897.
[c] Instruments transferred to Royal Obs. at Edinburgh in 1896.
[d] City Obs. since 1896.
[e] Based upon data from the U. S. C. and G. Survey.
[f] Point of reference before 1851, 7½ ft. N., 19 ft. W.
[g] At Bergedorf since 1909.
[h] Transit instrument before 1906, $0''.5$ N., $0^s.04$ W.
[i] Instruments transferred to the Astrophysical Institute of the Königstuhl Obs. in 1898.
[j] *Resultate des Internationalen Breitendienstes*, 1900–1908.
[k] *Resultate des Internationalen Breitendienstes*, Band I, 1903.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ′ ″	′ ″			h m s	s
101	Ithaca, N. Y.	+42 26 47.3[a]	−11 32.6	256[a]	9.999654	+5 5 55.99[a]	+50.26
102	Ithaca, N. Y.	+42 26 51.4	−11 32.6	. . .	9.999337	+5 5 56.47	+50.26
103	Jamaica, West Indies .	+18 24 51[b]	− 6 55.9	540[b]	9.999892	+5 11 29.48[b]	+51.17
104	Jena, Saxe-Weimar . .	+50 55 34.9[c]	−11 21.3	165[c]	9.999132	−0 46 20.22[c]	− 7.61
105	Jena, Saxe-Weimar . .	+50 55 35.8	−11 21.3	155	9.999131	−0 46 20.31	− 7.61
106	Jena, Saxe-Weimar . .	+50 56 11.0	−11 21.3	174	9.999132	−0 46 20.73	− 7.61
107	Johannesburg, Transvaal	−26 10 54.6[d]	+ 9 9.8	1804[d]	9.999840	−1 52 18.0[d]	−18.45
108	Kalocsa, Hungary . .	+46 31 41.7[b]	−11 34.8	117[e]	9.999240	−1 15 54.12[b]	−12.47
109	Kasan, Russia . . .	+55 50 20.0[f]	−10 47.3	98[f]	9.999007	−3 15 15.61[f]	−32.08
110	Kasan, Russia . . .	+55 47 23.9[g]	−10 47.7	79[g]	9.999007	−3 16 29.00[g]	−32.28
111	Kew, England . . .	+51 28 6	−11 18.5	10	9.999108	+0 1 15.1	+ 0.21
112	Kief, Russia.	+50 27 10.0[w]	−11 23.5	179[f]	9.999145	−2 2 0.56[f]	−20.04
113	Kiel, Prussia	+54 20 27.6[f]	−10 59.7	52[f]	9.999040	−0 40 35.45[f]	− 6.67
114	Kis-Kartal, Hungary .	+47 41 54.8	−11 32.8	. . .	9.999202	−1 18 11.7	−12.85
115	Konigsberg, Prussia .	+54 42 50.5[f]	−10 56.8	24[f]	9.999029	−1 21 58.97[f]	−13.47
116	Kremsmunster, Austria	+48 3 23.1[f]	−11 32.0	384[f]	9.999220	−0 56 31.58[f]	− 9.29
117	La Plata, Arg. Rep. .	−34 54 31.8[h]	+10 52.2	18[h]	9.999525	+3 51 44.8[h]	+38.07
118	Leiden, Netherlands .	+52 9 19.8[f]	−11 14.6	6[f]	9.999090	−0 17 56.15[f]	− 2.95
119	Leipzig, Saxony . . .	+51 20 5.9[i]	−11 19.2	119[i]	9.999118	−0 49 33.92[i]	− 8.14
120	Leipzig, Saxony . . .	+51 20 20.1	−11 19.2	. . .	9.999110	−0 49 29.92	− 8.13
121	Liege, Belgium . . .	+50 37 6	−11 22.8	127	9.999137	−0 22 15.44	− 3.66
122	Lisbon(Tapada), Portugal	+38 42 30.5[j]	−11 18.5	95[j]	9.999437	+0 36 44.68[j]	+ 6.04
123	Liverpool, England . .	+53 24 4.8	−11 6.6	61	9.999064	+0 12 17.33	+ 2.02
124	Liverpool, England . .	+53 24 47.8	−11 6.5	. . .	9.999059	+0 12 0.11	+ 1.97
125	Lund, Sweden . . .	+55 41 51.6[i]	−10 48.5	38	9.999006	−0 52 44.97[i]	− 8.67
126	Lund, Sweden . . .	+55 52 12.0	−10 47.0	. . .	9.999000	−0 52 47.50	− 8.67
127	Lussinpiccolo, Austria .	+44 32 11.0	−11 35.5	42	9.999286	−0 57 52.41	− 9.51
128	Lyons, France . . .	+45 41 41.0	−11 35.5	299	9.999274	−0 19 8.52[k]	− 3.14
129	Madison, Wis. . . .	+43 4 36.8[f]	−11 33.9	292[l]	9.999340	+5 57 37.90[f]	+58.75
130	Madras, India . . .	+13 4 8.0[f]	− 5 5.5	7	9.999926	−5 20 59.14	−52.73
131	Madrid, Spain . . .	+40 24 30.0[m]	−11 26.4	655[m]	9.999433	+0 14 45.09[m]	+ 2.42
132	Manila, P. I.	+14 34 41	− 5 38.2	3	9.999908	−8 3 54.2	−79.48
133	Mare Island, Cal. . .	+38 5 55.8[n]	−11 15.0	18[n]	9.999447	+8 9 5.63[n]	+80.35
134	Markree, Ireland . .	+54 10 31.8	−11 1.0	45	9.999044	+0 33 48.4	+ 5.55
135	Marseilles, France . .	+43 18 19[f]	−11 34.3	75[o]	9.999320	−0 21 34.55[f]	− 3.54
136	Marseilles, France . .	+43 17 52	−11 34.3	27	9.999317	−0 21 28.1	− 3.53
137	Mauritius (Port Louis) .	−20 5 39	+ 7 27.7	54	9.999832	−3 50 12.6	−37.82
138	Melbourne, Victoria .	−37 49 53.2[p]	+11 13.4	28[q]	9.999454	−9 39 53.92[p]	−95.26
139	Meudon, France . . .	+48 48 18	−11 29.8	162	9.999185	−0 8 55.6	− 1.47
140	Middletown, Conn. . .	+41 33 16.0	−11 30.4	. . .	9.999359	+4 50 37.18	+47.74
141	Milan, Italy	+45 27 59.3	−11 35.6	120	9.999268	−0 36 45.88[g]	− 6.04
142	Minneapolis, Minn. . .	+44 58 40.0[r]	−11 35.7	260[r]	9.999290	+6 12 57.04[r]	+61.27
143	Mizusawa, Japan . .	+39 8 3.6[x]	−11 20.7	62	9.999424	−9 24 30.75	−92.74
144	Modena, Italy . . .	+44 38 51.4	−11 35.6	64	9.999285	−0 43 43.40	− 7.18
145	Montreal, Canada . .	+45 30 20[s]	−11 35.6	57[s]	9.999262	+4 54 18.63[s]	+48.35
146	Moscow (Presnia), Russia	+55 45 19.5	−10 48.0	150[f]	9.999012	−2 30 17.03[f]	−24.69
147	Mount Hamilton, Cal. .	+37 20 25.6[r]	−11 10.4	1284[r]	9.999552	+8 6 34.89[r]	+79.93
148	Mount Wilson, Cal. . .	+34 12 59.5[t]	−10 46.2	1799[t]	9.999663	+7 52 14.33[t]	+77.58
149	Mount Wilson, Cal. . .	+34 12 55	−10 46.1	1727[u]	9.999658	+7 52 14.3	+77.58
150	Munich, Bavaria . .	+48 8 45.5[v]	−11 31.7	529[v]	9.999227	−0 46 26.02[v]	− 7.63

[a] Top of east pier in transit room.
[b] Transit instrument pier.
[c] Bamberg equatorial.
[d] International latitude hut.
[e] Seven-inch equatorial.
[f] Meridian circle.
[g] Center of great dome.
[h] Gautier meridian circle.
[i] Center of observatory.
[j] Center of dome.
[k] Pier of small meridian circle.
[l] Main floor.
[m] Center of rotunda.
[n] East transit instrument.
[o] Barometer.
[p] Old meridian circle.
[q] Floor of meridian room.
[r] Transit instrument.
[s] East transit pier.
[t] Snow telescope pier.
[u] Floor.
[v] West dome.
[w] Photographic equatorial, 41 feet south of prime vertical transit.
[x] Zenith telescope.

Authority for—		Description.
Latitude.	Longitude.	
Letter from the Dean, 1913.	Letter from the Dean, 1913.	[a] Fuertes Obs., Cornell Univ.
Letter from the Dean, 1913.	Letter from the Dean, 1913.	[b] Fuertes Obs., Cornell Univ.
Memoirs, R. A. S., 1879.	See footnote ([c]).	Mr. Hall's Obs., Montego Bay.
Letter from Director, 1913.	Letter from Director, 1913.	Univ. Obs., since 1888.
Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Univ. Obs., before 1888.
V. J. S. Astron. Gesell., 1910.	*V. J. S. Astron. Gesell.*, 1910.	The late Dr. Winkler's Obs.
Transvaal Obs. *Circular*, 1910.	Transvaal Obs. *Circular*, 1910.	Union Obs., formerly Transvaal Obs.
Letter from Director, 1913.	Letter from Director, 1913.	Archiepiscopal Haynald Obs.
Letter from Director, 1913.	Publications of the Obs., 1911.	Englehardt Obs., Univ. of Kasan.
Publications of the Obs., 1911.	Letter from Director, 1913.	University Observatory.
Letter from Director, 1897.	Letter from Director, 1897.	Meteorological Obs., London.
Annales de l' Obs., Vol. IV, 1893.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial Univ. Obs.
Les Obs. Astron., Bruxelles, 1907.	*Astron. Nach.*, Nr. 3993, 1905.	[d] Royal University Obs.
Les Obs. Astron., Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Near Aszòd, Hungary.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal University Obs.
Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Obs. of the Benedictines.
Letter from Director, 1913.	Letter from Director, 1913.	National Univ. Obs.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	University Obs., since 1861.
Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	University Obs., before 1861.
Les Obs. Astron., Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	University Obs., Cointe.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3202, 1893.	Obs. of Lisbon.
Monthly Notices, R. A. S., 1894.	*Monthly Notices, R. A. S.*, 1894.	Bidston, Birkenhead, since 1867.
British *Nautical Almanac*, 1872.	British *Nautical Almanac*, 1872.	Liverpool Obs., before 1867.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905	Royal Univ. Obs., since 1867.
Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Royal Univ. Obs., before 1867.
Letter from Director, 1897.	Letter from Director, 1897.	Manora Observatory.
Letter from Director, 1897.	*Astron. Nach.*, Nr. 3202, 1893.	Obs. of the Univ., St. Genis Laval.
Publications of the Obs., 1892.	Letter from Director, 1912.	Washburn Obs., Univ. of Wis.
Great Trig. Survey of India, 1906.	*Great Trig. Survey of India*, 1901.	Obs. founded by East India Co.
Annuario del Obs., 1912.	*Astron. Nach.*, Nr. 3993, 1905.	Astron. and Meteorolog. Obs.
Les Obs. Astron., Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Meteorological Observatory.
Letter from Director, 1913.	*Lick Obs. Bulletin*, 1908.	Chronom. and Time Sta., Navy Yd.
Astron. Nach., Nr. 758, 1851.	British *Nautical Almanac*, 1901.	Col. Cooper's Observatory.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	See footnote ([e]).
Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	See footnote ([f]).
Mag. and Meteor. *Results*, 1908.	Mag. and Meteor. *Results*, 1908.	Royal Alfred Obs.
Astron. Results, 1881–84.	[i] *Astron. Results*, 1881–84.	[g] Government Observatory.
Les Obs. Astron., Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Seine-et-Oise, near Paris.
Letter from Director, 1894.	Letter from Director, 1894.	Wesleyan University Obs.
Pubbl. del R. Osserv., 1914.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Observatory, Brera.
Letter from Director, 1915.	Letter from Director, 1915.	Obs. Univ. of Minn.
See footnote ([h]).	*Les Obs. Astron.*, Bruxelles, 1907.	International Lat. Obs.
Letter from Director, 1913.	Letter from Director, 1913.	Royal Univ. Geophysical Obs.
Letter from Director, 1912.	*U. S. C. and G. S. Report*, 1897.	McGill University Obs.
Les Obs. Astron., Bruxelles, 1907.	*Astron. Nach.*, Nr. 3993, 1905.	Obs. of the Imperial Univ.
Publications of the Obs., 1900.	*U. S. C. and G. S. Report*, 1897.	Lick Obs., Univ. of Cal.
Astrophysical Journal, 1906.	*Astrophysical Journal*, 1906.	Solar Obs., Carnegie Inst.
Letter from C. G. Abbot, 1912.	Letter from C. G. Abbot, 1912.	Branch of Smithson. Astrophys. Obs.
Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Observatory.

[a] Since 1902.
[b] Before 1902.
[c] *British Report on Transit of Venus*, 1882.
[d] Old position of meridian circle, $0''.9$ N., $0^{s}.12$ E.
[e] National Obs., Univ. of Aix-Marseilles, since 1864–66.
[f] National Obs., at Accoules, before 1864–66.
[g] Transferred from Williamstown in 1861.
[h] *Resultate des Internationalen Breitendienstes*, 1900–1908.
[i] With the new values of the longitudes of Adelaide and Sydney.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ′ ″	′ ″			h m s	s
151	Naples, Italy	+40 51 46.3	−11 28.1	164	9.999388	−0 57 1.70[a]	− 9.37
152	Nashville, Tenn.	+36 8 54.4[b]	−11 2.0	172[c]	9.999505	+5 47 12.2	+57.04
153	Neuchâtel, Switzerland	+46 59 50.6	−11 34.1	488	9.999254	−0 27 49.90[d]	− 4.57
154	New Brunswick, N. J.	+40 30 1.4[b]	−11 26.7	21[b]	9.999387	+4 57 47.45[b]	+48.92
155	New Haven, Conn.	+41 19 22.3	−11 29.6	40	9.999368	+4 51 40.58	+47.92
156	New Haven, Conn.	+41 18 36.5	−11 29.6	. . .	9.999365	+4 51 42.16	+47.92
157	New York, N. Y.	+40 48 34.6	−11 27.9	25	9.999380	+4 55 50	+48.60
158	New York, N. Y.	+40 45 23.1	−11 27.7	. . .	9.999379	+4 55 53.64	+48.61
159	Nice, France	+43 43 16.9[e]	−11 34.9	378	9.999330	−0 29 12.15[e]	− 4.80
160	Nikolaieff, Russia	+46 58 22.1	−11 34.2	55	9.999225	−2 7 53.78[a]	−21.01
161	Northampton, Mass.	+42 19 1.9[b]	−11 32.4	70[b]	9.999345	+4 50 33.10[b]	+47.73
162	Northfield, Minn.	+44 27 41.6[f]	−11 35.5	290[f]	9.999305	+6 12 35.92[f]	+61.21
163	Oakland, Cal.	+37 48 5[d]	−11 13.2	11[d]	9.999454	+8 9 6.55[d]	+80.35
164	Odessa, Russia	+46 28 37.5	−11 34.9	. . .	9.999234	−2 3 2.18[b]	−20.21
165	Odessa, Russia	+46 28 36.7[d]	−11 34.9	55[d]	9.999237	−2 3 2.04[d]	−20.21
166	O-Gyalla, Hungary	+47 52 27.3	−11 32.4	113	9.999206	−1 12 45.49	−11.95
167	Omaha, Nebr.	+41 16 5.6[b]	−11 29.5	344[b]	9.999390	+6 23 46.96[b]	+63.05
168	Orono, Me.	+44 54 0	−11 35.6	38	9.999277	+4 34 40.3	+45.12
169	Ottawa, Canada	+45 23 39.1[d]	−11 35.6	85[g]	9.999267	+5 2 51.98[d]	+49.75
170	Oxford, Miss.	+34 22 12.6	−10 47.5	. . .	9.999536	+5 58 7.18	+58.83
171	Oxford, England	+51 45 35.6[d]	−11 16.9	65[h]	9.999104	+0 5 2.6	+ 0.83
172	Oxford, England	+51 45 34.2	−11 16.9	64	9.999104	+0 5 0.40	+ 0.82
173	Padua, Italy	+45 24 1.0[i]	−11 35.6	31[j]	9.999263	−0 47 29.13[i]	− 7.80
174	Palermo, Sicily	+38 6 44.0[k]	−11 15.1	76[d]	9.999451	−0 53 25.87	− 8.78
175	Paris, France	+48 50 11.2[l]	−11 29.8	67[m]	9.999178	−0 9 20.93[n]	− 1.53
176	Perth, West Australia	−31 57 8.9[d]	+10 23.8	60	9.999597	−7 43 21.51[d]	−76.12
177	Philadelphia, Pa.	+39 58 2.1[o]	−11 24.6	74[o]	9.999404	+5 1 6.81[o]	+49.46
178	Pola, Austria	+44 51 48.6[d]	−11 35.6	32[d]	9.999277	−0 55 23.07[d]	− 9.10
179	Potsdam, Prussia	+52 22 56.0[p]	−11 13.3	97[p]	9.999091	−0 52 15.86[p]	− 8.59
180	Poughkeepsie, N. Y.	+41 41 18	−11 30.8	61	9.999360	+4 55 33.6[b]	+48.55
181	Prague, Bohemia	+50 5 16.0[o]	−11 25.1	197[o]	9.999155	−0 57 40.28[o]	− 9.47
182	Princeton, N. J.	+40 20 55.8	−11 26.1	75	9.999395	+4 58 39.44	+49.06
183	Princeton, N. J.	+40 20 57.8[d]	−11 26.1	65[d]	9.999394	+4 58 37.61[d]	+49.06
184	Providence, R. I.	+41 50 21	−11 31.2	64	9.999356	+4 45 35.95	+46.92
185	Providence, R. I.	+41 49 46.4	−11 31.2	. . .	9.999352	+4 45 37.64	+46.92
186	Pulkowa, Russia	+59 46 18.7[a]	−10 6.2	75[q]	9.998914	−2 1 18.57[a]	−19.93
187	Quebec, Canada	+46 47 59.2	−11 34.4	90	9.999231	+4 44 52.71[b]	+46.80
188	Quito, Ecuador	− 0 14 0	+ 0 5.6	2908	0.000198	+5 14 6.66	+51.60
189	Riga, Russia	+56 57 9.3	−10 36.9	. . .	9.998974	−1 36 28.10[r]	−15.85
190	Rio de Janeiro, Brazil	−22 54 23.8[o]	+ 8 17.7	62[o]	9.999784	+2 52 41.4[o]	+28.37
191	Rome, Italy	+41 53 53.6[d]	−11 31.3	51[j]	9.999354	−0 49 55.12[d]	− 8.20
192	Rome, Italy	+41 53 33.6[d]	−11 31.3	65[q]	9.999355	−0 49 56.34[d]	− 8.20
193	Rome, Italy	+41 54 12.4[d]	−11 31.4	100[d]	9.999357	−0 49 48.02[d]	− 8.18
194	Rome, Italy	+41 54 16.7	−11 31.4	75[j]	9.999355	−0 49 49.28[d]	− 8.18
195	San Fernando, Spain	+36 27 42.0[s]	−11 4.3	30[s]	9.999488	+0 24 49.82[s]	+ 4.08
196	San Fernando, Spain	+36 31 7	−11 4.7	. . .	9.999485	+0 25 10.82	+ 4.14
197	San Francisco, Cal.	+37 47 27.9	−11 13.2	. . .	9.999454	+8 9 42.86[t]	+80.45
198	San Luis, Arg. Rep.	−33 17 45.7	+10 37.6	800	9.999616	+4 25 22	+43.60
199	Santiago, Chile	−33 26 42[d]	+10 39.0	520[d]	9.999594	+4 42 46.0[d]	+46.45
200	Santiago, Chile	−33 26 25	+10 38.9	619	9.999600	+4 42 36.5	+46.42
201	Santiago, Chile	−33 33 46[b]	+10 40.1	580[b]	9.999595	+4 42 46[b]	+46.45

[a] Center of observatory.
[b] Transit instrument.
[c] Bench mark on obs. steps.
[d] Meridian circle.
[e] Small meridian circle.
[f] Meridian circle pier.
[g] Bench mark in east wall.
[h] Barometer basin.
[i] Axis of tower.
[j] Barometer.
[k] Center of south dome.
[l] South facade of observatory.
[m] Level of obs. terrace.
[n] Cassini's Meridian.
[o] Center of dome.
[p] Center of middle dome.
[q] Main floor.
[r] Tower of school.
[s] Center of building, ground floor.
[t] West transit pier.

No.	Authority for—		Description.
	Latitude.	Longitude.	
151	Letter from Director, 1897.	*Astron. Nach.*. Nr. 3202, 1893.	Royal Obs., Capo di Monte.
152	Letter from the Dean, 1913.	Letter from Director, 1893.	Obs. of Vanderbilt Univ.
153	Swiss Triangulation, 1890.	*Astron. Nach.*, Nr. 3202, 1893.	Cantonal Observatory.
154	Letter from Director, 1913.	Letter from Director, 1913.	SchanckObs.,RutgersCollege.
155	Letter from Director, 1893.	See footnote (h).	Yale Univ. Obs., since 1882.
156	Letter, Director new Obs., 1893.	Letter, Director new Obs., 1893.	Yale Univ. Obs., before 1882.
157	*Contributions from the Obs.*, 1906.	*Contributions from the Obs.*, 1906.	Columbia Univ. Obs., since 1897.
158	Letter from Director, 1879.	British *Nautical Almanac.*	Columbia Univ. Obs., before 1897.
159	*Annales de l'Obs.*, Tome II, 1887.	*Astron. Nach.*, Nr. 3993, 1905.	Mt. Gros, near Nice.
160	*Les Obs. Astron.*, Bruxelles, 1907.	*Astron. Nach.*, Nr. 3202, 1893.	Naval Observatory.
161	Letter from Director, 1913.	Harvard *Annals*, 1893.	Smith College Obs.
162	Letter from Director, 1912.	*Publications* of Obs., 1901.	[a] Goodsell Obs., Carleton College.
163	Letter from Director, 1912.	Letter from Director, 1912.	Chabot Observatory.
164	Pulkowa *Mitteilungen*, No. 56, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Branch of Pulkowa Obs.
165	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
166	Letter from Director, 1897.	Letter from Director, 1897.	Royal Astrophysical Obs.
167	Letter from Director, 1912.	Letter from Director, 1912.	Creighton University Obs.
168	Letter from Director, 1912.	Letter from Director, 1912.	Obs. Univ. of Maine.
169	Letter from Chief Astronomer, 1913.	Letter from Chief Astronomer, 1913.	Dominion Astronomical Obs.
170	Smithsonian *Report*, 1880.	Smithsonian *Report*, 1880.	Obs. Univ. of Mississippi.
171	*Radcliffe Catalogue of Stars*, 1900.	*Radcliffe Observations*, 1842.	Radcliffe Observatory.
172	*Oxford Astron. Observations*, 1878.	*Oxford Astron. Observations*, 1878.	University Observatory.
173	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal University Obs.
174	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3202, 1893.	Royal Observatory.
175	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Observatory of Paris.
176	*Meridian Observations*, Vol. 2, 1908.	[i] *Meridian Observations*, Vol. 2, 1908.	Government Observatory.
177	Letter from Director, 1913.	Letter from Director, 1913.	Flower Obs., Univ. of Pa.
178	Letter from Director, 1913.	Letter from Director, 1913.	See footnote (b).
179	*Veröff. K. Preuss. Geol. Inst.*, 1905.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Astrophysical Obs.
180	Smithsonian *Report*, 1880.	Smithsonian *Report*, 1880.	Vassar College Obs.
181	Prague *Observations*, 1907.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial and Royal Obs.
182	Letter from Director, 1913.	Letter from Director, 1913.	Halsted Obs., Princeton Univ.
183	Letter from Director, 1913.	*Washington Observations*, 1878.	Obs. of Instruction, Princeton Univ.
184	Letter from Director, 1893.	Letter from Director, 1893.	Ladd Obs., Brown Univ.
185	*Astron. Nach.*, Nr. 2254, 1879.	*Astron. Nach.*, Nr. 2254, 1879.	Mr. Seagrave's Observatory.
186	*Description de l'Obs.*, 1845.	*Astron. Nach.*, Nr. 3993, 1905.	Obs. Central Nicolas.
187	Letter from Director, 1912.	Letter from Director, 1912.	Quebec Obs., Plains of Abraham.
188	Letter from Director, 1897.	Letter from Director, 1897.	National Observatory.
189	Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Polytechnic School Obs.
190	See footnote (c).	See footnote (c).	National Observatory.
191	*Memorie del R. Osserv.*, 1904.	Letter from Director, 1913.	Royal Obs. at Roman College.
192	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Univ. Obs. at Capitol.
193	Letter from Director, 1913.	Letter from Director, 1913.	Vatican Obs., since 1906–7.
194	*Pubbl. della Specola Vaticana*, 1905.	*Astron. Nach.*, Nr. 3993, 1905.	[d] Vatican Obs., before 1906–7.
195	*Annales del Obs.*, 1892.	Letter from Director, 1913.	Naval Obs., since 1797.
196	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	[e] Naval Obs., before 1797.
197	Letter from Director, 1897.	*U. S. C. and G. S. Report*, 1897.	Davidson Observatory.
198	Letter from Director, 1911.	Letter from Director, 1911.	Southern Obs. of Carnegie Inst.
199	Letter from Director, 1913.	Letter from Director, 1913.	[f] National Obs., since 1862.
200	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	[g] National Obs., before 1862.
201	Letter from Director, 1913.	Letter from Director, 1913.	National Obs., Espejo.

[a] Old observatory, 1877–1886, 415 feet W.

[b] Observatory of Imperial and Royal Hydrographic Office.

[c] Green and Davis, *Telegraphic Determinations of Longitudes on the East Coast of South America*, 1880.

[d] In the Gregorian tower.

[e] In Cadiz.

[f] In Quinta Normal.

[g] On the hill Santa Lucia, in Sanitago.

[h] Based upon data from the U. S. C. and G. Survey.

[i] With the new value of the longitude of Sydney.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.
		° ′ ″	′ ″			h m s	s
202	South Bethlehem, Pa.	+40 36 23.2 *a*	−11 27.2	110	9.999391	+ 5 1 31.96 *a*	+ 49.5
203	South Hadley, Mass.	+42 15 18.2 *b*	−11 32.2	76 *b*	9.999346	+ 4 50 20.40 *b*	+ 47.7
204	St. Louis, Mo.	+38 38 3.0	−11 18.1	. . .	9.999432	+ 6 0 49.26	+ 59.2
205	St. Petersburg, Russia	+59 56 32.0	−10 4.2	4	9.998906	− 2 1 11.4	− 19.9
206	Stockholm, Sweden	+59 20 32.7 *c*	−10 11.3	44 *c*	9.998922	− 1 12 13.97 *c*	− 11.8
207	Stonyhurst, England	+53 50 40	−11 3.4	117 *c*	9.999056	+ 0 9 52.68	+ 1.6
208	Strassburg, Alsace	+48 35 0.3 *c*	−11 30.5	144 *c*	9.999190	− 0 31 4.52 *c*	− 5.1
209	Swarthmore, Pa.	+39 54 23.3	−11 24.3	. . .	9.999401	+ 5 1 24.89	+ 49.5
210	Sydney, N. S. W.	−33 51 41.1	+10 42.9	44	9.999552	−10 4 49.31	− 99.3
211	Syracuse, N. Y.	+43 2 13.1	−11 33.9	160	9.999332	+ 5 4 33.36	+ 50.0
212	Syracuse, N. Y.	+43 0 48.8 *h*	−11 33.8	137 *u*	9.999332	+ 5 4 34.31 *h*	+ 50.0
213	Tacubaya, Mexico	+19 24 17.9 *c*	− 7 14.8	2285 *c*	9.999995	+ 6 36 46.67 *c*	+ 65.1
214	Tashkent, Turkestan	+41 19 31.3	−11 29.6	457	9.999396	− 4 37 10.80	− 45.5
215	Taunton, Mass.	+41 54 0	−11 31.3	8	9.999351	+ 4 44 20	− 46.7
216	Teramo, Italy	+42 39 27 *d*	−11 33.1	398	9.999358	− 0 54 56	− 9.0
217	Tokyo, Japan	+35 39 17.0 *c*	−10 58.3	25	9.999507	− 9 18 58.22 *e*	− 91.8
218	Toronto, Canada	+43 39 46.0 *f*	−11 34.8	110 *g*	9.999313	+ 5 17 34.70 *g*	+ 52.17
219	Toronto, Canada	+43 40 0.8 *g*	−11 34.8	116 *g*	9.999313	+ 5 17 35.60 *g*	+ 52.17
220	Toulouse, France	+43 36 44.0	−11 34.7	194	9.999320	− 0 5 51.23	− 0.96
221	Triest, Austria	+45 38 35.5 *h*	−11 35.5	68 *i*	9.999260	− 0 55 5.23 *h*	− 9.05
222	Triest, Austria	+45 38 45.4 *j*	−11 35.5	26 *i*	9.999257	− 0 55 3.0	− 9.04
223	Tschardjui, Turkestan	+39 8 11.0 *d*	−11 20.7	188 *d*	9.999433	− 4 14 17.2 *d*	− 41.77
224	Tschardjui, Turkestan	+39 8 10.7 *d*	−11 20.7	167	9.999431	− 4 13 57.3	− 41.72
225	Tulse Hill, England	+51 26 47	−11 18.6	48	9.999111	+ 0 0 27.7	+ 0.08
226	Turin, Italy	+45 2 16.3 *k*	−11 35.7	616 *k*	9.999313	− 0 31 5.96 *k*	− 5.11
227	Turin, Italy	+45 4 8.3 *c*	−11 35.7	276 *i*	9.999288	− 0 30 47.15 *c*	− 5.06
228	Tuscaloosa, Ala.	+33 12 36.8 *c*	−10 36.7	69	9.999568	+ 5 50 11.74 *c*	+ 57.53
229	Ukiah, Cal.	+39 8 12.1 *d*	−11 20.7	220 *d*	9.999435	+ 8 12 50.3 *d*	+ 80.96
230	Upsala, Sweden	+59 51 29.4 *b*	−10 5.2	21 *b*	9.998909	− 1 10 30.12 *b*	− 11.58
231	Urbana, Ill.	+40 6 20.2 *l*	−11 25.2	236 *l*	9.999412	+ 5 52 53.90 *l*	+ 57.97
232	Utrecht, Netherlands	+52 5 9.7 *m*	−11 15.0	12 *m*	9.999093	− 0 20 31.0 *m*	− 3.37
233	Utrecht, Netherlands	+52 5 13	−11 15.0	23	9.999093	− 0 20 28.9	− 3.36
234	Venice, Italy	+45 26 10.5 *c*	−11 35.6	15 *c*	9.999261	− 0 49 22.12 *c*	− 8.11
235	Vienna, Austria	+48 13 55.1 *n*	−11 31.5	240 *i*	9.999205	− 1 5 21.35 *n*	− 10.74
236	Vienna, Austria	+48 12 35.5	−11 31.6	186 *i*	9.999202	− 1 5 31.61	− 10.76
237	Vienna, Austria	+48 12 53.8	−11 31.6	214	9.999204	− 1 5 25.17	− 10.75
238	Vienna, Austria	+48 12 46.7 *c*	−11 31.6	285	9.999209	− 1 5 10.96	− 10.71
239	Warsaw, Russia	+52 13 4.6 *c*	−11 14.3	121 *c*	9.999097	− 1 24 7.25 *c*	− 13.82
240	Washington, D. C.	+38 55 14.0 *o*	−11 19.6	82 *p*	9.999431	+ 5 8 15.78 *o*	+ 50.64
241	Washington, D. C.	+38 53 38.7 *q*	−11 19.4	31 *r*	9.999428	+ 5 8 12.15 *q*	+ 50.63
242	Washington, D. C.	+38 53 17.3 *s*	−11 19.4	10 *s*	9.999427	+ 5 8 6.24 *s*	+ 50.61
243	Washington, D. C.	+38 56 14.8 *a*	−11 19.7	. . .	9.999425	+ 5 8 0.0 *a*	+ 50.60
244	Wellesley, Mass.	+42 17 34.8	−11 32.3	61	9.999344	+ 4 45 12.7	+ 46.85
245	Wellington, N. Z.	−41 17 3.8 *b*	+11 29.5	127 *b*	9.999375	−11 39 4.27 *b*	−114.84
246	West Point, N. Y.	+41 23 22.1	−11 29.9	170	9.999375	+ 4 55 50.55	+ 48.60
247	Wilhelmshaven, Germany	+53 31 52.1 *c*	−11 5.7	9 *c*	9.999057	− 0 32 35.06 *c*	− 5.35
248	Williams Bay, Wis.	+42 34 12.6 *t*	−11 33.0	320 *t*	9.999355	+ 5 54 13.24 *t*	+ 58.19
249	Williamstown, Mass.	+42 42 30	−11 33.2	213	9.999344	+ 4 52 50	+ 48.10
250	Winchester, Mass.	+42 27 11	−11 32.7	30	9.999338	+ 4 44 32.4	+ 46.74
251	Windsor, N. S. W.	−33 36 30.8 *b*	+10 40.6	16 *r*	9.999556	−10 3 19.9	− 99.11
252	Zô-Sè, China	+31 5 48.0 *c*	−10 14.4	100 *c*	9.999619	− 8 4 44.82 *c*	− 79.63
253	Zurich, Switzerland	+47 22 38.3 *c*	−11 33.5	469 *c*	9.999243	− 0 34 12.26 *c*	− 5.62

a Center of dome.
b Transit instrument.
c Meridian circle.
d Zenith telescope.
e Great transit instrument.
f Main dome.
g Transit pier.
h Equatorial pier.
i Barometer cistern.
j Stone pier in terrace wall.
k Prime vertical instrument.
l 12-inch equatorial.
m Altazimuth pier.
n Central dome.
o Center of the clock room.
p Ground floor of main building.
q Small dome.
r Barometer.
s Siderostat pier.
t 40-inch equatorial.
u Intersection of equatorial axes.

No.	Authority for—		Description.
	Latitude.	Longitude.	
202	Letter from Director, 1913.	*Washington Observations*, 1875.	Sayre Obs., Lehigh Univ.
203	*Amer. Jour. of Sci.*, 1883.	Letter from Director, 1913.	Williston Obs., Mt. Holyoke Coll.
204	Letter from Director, 1897.	*U. S. C. and G. S. Report*, 1897.	[a] Washington University Obs.
205	*Astron. Nach.*, Nr. 2582, 1884.	*Astron. Nach.*, Nr. 2582, 1884.	Imperial University Obs.
206	Letter from Director, 1914.	*Astron. Nach.*, Nr. 3993, 1905.	Obs. of Acad. of Sci.
207	Letter from Director, 1913.	*Monthly Notices, R. A. S.*, 1851.	Stonyhurst College Obs.
208	*Annalen* der Sternw., 1896.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial Univ. Obs.
209	Letter from Director, 1912.	Letter from Director, 1912.	Sproul Obs., Swarthmore College.
210	*Astron. Results*, 1879–81.	See footnote ([b]).	Government Observatory.
211	Letter from Director, 1891.	Letter from Director, 1891.	Syracuse Univ. Obs.
212	Letter from Director, 1914.	Letter from Director, 1914.	Roe Observatory.
213	*Boletin del Obs.*, 1914.	*Annuario del Obs.*, 1902.	National Observatory.
214	Letter from Director, 1897.	Letter from Director, 1897.	Tashkent Observatory.
215	*Les Obs. Astron.*, Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Mr. Metcalf's Obs., before 1911.
216	*Pubbl. dell'Osserv.*, 1900.	Letter from Director, 1913.	Collurania Observatory.
217	*Annales de l'Obs.*, 1894.	*Annales de l'Obs.*, 1894.	University Observatory.
218	Letter from Director, 1913.	Letter from Director, 1913.	University Observatory.
219	Letter from Director, 1912.	Letter from Director, 1912.	Meteorological Observatory.
220	*Annales de l'Obs.*, 1912.	British *Nautical Almanac*.	University Observatory.
221	Letter from Director, 1913.	Letter from Director, 1913.	[c] Imperial and Royal Maritime Obs.
222	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	[d] Imperial and Royal Maritime Obs.
223	*Astron. Nach.*, Nr. 4588, 1912.	Letter from Director, 1913.	International Lat. Obs., since 1909.
224	See footnote ([e]).	See footnote ([l]).	International Lat. Obs., before 1909.
225	British *Nautical Almanac*.	British *Nautical Almanac*.	Obs. of Sir W. Huggins, London.
226	Letter from Director, 1915.	Letter from Director, 1915.	[f] Royal Obs. of the Univ., since 1913.
227	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	[g] Royal Obs. of the Univ., before 1913.
228	Letter from Director, 1897.	Letter from Director, 1897.	Obs. Univ. of Ala.
229	See footnote ([e]).	Letter from Director, 1912.	International Lat. Obs.
230	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
231	Letter from Director, 1913.	Letter from Director, 1913.	Obs., Univ. of Ill.
232	Letter from Director, 1913.	Letter from Director, 1913.	University Obs., since 1855.
233	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	University Obs., before 1855.
234	Letter from Director, 1913.	Letter from Director, 1913.	Obs. of the Nautical Institute.
235	See footnote ([h]).	*Astron. Nach.*, Nr. 3993, 1905.	[i] Imperial and Royal Univ. Obs.
236	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	[j] Imperial and Royal Univ. Obs.
237	*Berliner Jahrbuch.*	*Berliner Jahrbuch.*	Oppolzer Obs., Josephstadt.
238	*Publik. der Sternw.*, 1892.	*Astron. Nach.*, Nr. 3993, 1905.	Kuffner Obs., Ottakring.
239	*Astron. Nach.*, Nr. 4666, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial University Obs.
240	*U. S. Naval Obs. Publications*, 1900.	*U. S. C. and G. S. Report*, 1897.	U. S. N. Obs., Georgetown Heights.
241	See footnote ([m]).	*U. S. C. and G. S. Report*, 1897.	U. S. Naval Obs., 1842–1893.
242	Letter from Director, 1912.	Letter from Director, 1912.	Smithsonian Astrophysical Obs.
243	*Astronomical Journal*, 1897.	*Astronomical Journal*, 1897.	Catholic Univ. Obs., Brookland.
244	Letter from Director, 1912.	*Les Obs. Astron.*, Bruxelles, 1907.	Whitin Obs., Wellesley College.
245	*New Zealand Gazette*, May 7, 1914.	*New Zealand Gazette*, May 7, 1914.	Hector Observatory.
246	Letter from Director, 1891.	Letter from Director, 1891.	[k] U. S. Military Academy.
247	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial Naval Obs.
248	*Astrophysical Journal*, 1901.	*Astrophysical Journal*, 1901.	Yerkes Obs., Univ. of Chicago.
249	Letter from Director, 1893.	Letter from Director, 1893.	Field Memorial Obs., Williams Coll.
250	Letter from Director, 1913.	Letter from Director, 1913.	Mr. Metcalf's Obs., since 1911.
251	*Monthly Notices, R. A. S.*, 1884.	[n] *Monthly Notices, R. A. S.*, 1888.	Mr. John Tebbutt's Obs.
252	*Annales de l'Obs.*, 1907.	*Annales de l'Obs.*, 1907.	Obs. of the Jesuits near Shanghai.
253	Letter from Director, 1913.	*Astron. Nach.*, Nr. 3202, 1893.	Obs. of Swiss Polytechnic School.

[a] Old observatory $0^m.125$ E.

[b] Letter from Government Astronomer at Adelaide, 1913.

[c] Since 1898.

[d] Before 1898.

[e] *Resultate des Internationalen Breitendienstes*, 1900–1908.

[f] At Pino Torinese.

[g] At Palazzo Madama.

[h] *Astron. Arbeiten des K. K. Gradmessungs-Bureau*, 1896.

[i] Since 1879.

[j] Before 1879.

[k] Old observatory 9″ N., $1^s.2$ E.

[l] *Resultate des Internationalen Breitendienstes*, Band I, 1903.

[m] *Washington Observations* for 1892, Appendix I, pp. XXI and XXXII.

[n] And the new value of the longitude of Sydney.

THE COMPUTATION OF LUNAR DISTANCES.

Tables of lunar distances are no longer given in the Ephemeris, in acco ance with the decision of the Navy Department that they are now of lit practical use to navigators. However, in case it is desired to use this meth the angular distance between the Moon and any heavenly body may be c culated by solving the spherical triangle of which the known parts are the po distances of the Moon and the other body and the difference of their rig ascensions, or, in other words, the angle at the pole between their hour-circl Then, the Greenwich mean time of the observation being approximately know and the lunar distances for the star or other body calculated for the even ho before and after, the required lunar distance may be interpolated and t longitude derived by the methods given in books on navigation.

EXAMPLE 1.

Find the lunar distance of Aldebaran, July 27, 1919, at 10 P. M., Greenwich Mean Time.

Let α and δ = Right Ascension and Declination of the star
" α' and δ' = " " " " " " Moon
" D = Lunar Distance
Also let tan M = tan δ' sec $(\alpha-\alpha')$
Then cos D = sin δ' cos $(M-\delta)$ cosec M

α	$4^h\ 31^m\ 18^s.5$	M	28° 23′ 10″
α'	$8^h\ 55^m\ 22^s.2$	δ	+16° 20′ 53″
$\alpha-\alpha'$	$19^h\ 35^m\ 56^s.3$	$M-\delta$	12° 2′ 17″
$\alpha-\alpha'$	293° 59′ 4″	sin δ'	9.331520
δ'	+ 12° 23′ 20″	cos $(M-\delta)$	9.990343
tan δ'	9.341753	cosec M	0.322931
sec $(\alpha-\alpha')$	0.390952	cos D	9.644794
tan M	9.732705	D	63° 48′ 33″

EXAMPLE 2.

Find the lunar distance of Jupiter, March 11, 1919, at noon, Greenwich Mean Time. In t case the distance is smaller and the following method is more accurate:

Let α and δ = Right Ascension and Declination of the planet
" α' and δ' = " " " " " " Moon
" D = Lunar Distance
Also let tan N = tan ½ $(\alpha-\alpha')$ cos ½ $(\delta+\delta')$ cosec ½ $(\delta-\delta')$
Then sin ½ D = sin ½ $(\alpha-\alpha')$ cos ½ $(\delta+\delta')$ cosec N

Sin N and sin ½ $(\alpha-\alpha')$ have the same algebraic sign.

α	$6^h\ 25^m\ 40^s.9$	tan ½ $(\alpha-\alpha')$	9.092439 *n*
α'	$7^h\ 22^m\ 6^s.3$	cos ½ $(\delta+\delta')$	9.969878
$\alpha-\alpha'$	$23^h\ 3^m\ 34^s.6$	cosec ½ $(\delta-\delta')$	1.379447
$\alpha-\alpha'$	345° 53′ 39″	tan N	0.441764 *n*
δ	+ 23° 29′ 9″	N	109° 52′ 49″
δ'	+ 18° 42′ 5″		
$\delta+\delta'$	+ 42° 11′ 14″	sin ½ $(\alpha-\alpha')$	9.089140
$\delta-\delta'$	+ 4° 47′ 4″	cos ½ $(\delta+\delta')$	9.969878
		cosec N	0.026685
½ $(\alpha-\alpha')$	172° 56′ 50″	sin ½ D	9.085703
½ $(\delta+\delta')$	+ 21° 5′ 37″	½ D	6° 59′ 49″
½ $(\delta-\delta')$	+ 2° 23′ 32″	D	13° 59′ 38″

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1919.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to the local sidereal time.

Take out the apparent right ascension and declination of Polaris for the time of observation.

Subtract the apparent right ascension from the local sidereal time of observation and the remainder is the hour-angle of Polaris.

With this hour-angle as the vertical argument, and the apparent declination of Polaris as the horizontal argument, take out the correction from Table I and add it to or subtract it from the true altitude, according to its sign.

For altitudes other than 45°, corrections taken from the supplementary table at the bottom of Table I (Table Ia) may be applied when necessary for the degree of accuracy required.

Example.—August 5, 1919, at 10ʰ 40ᵐ 30ˢ P. M. local mean solar time, in longitude 59° west of Greenwich, suppose the true altitude of Polaris to be 33° 20′ 0″, required the latitude of the place.

	h	m	s
Local astronomical mean time	10	40	30
Reduction from Table III for 10ʰ 40ᵐ 30ˢ		+ 1	45
Greenwich sidereal time of mean noon, August 5, page 10 .	8	51	57
Reduction from Table III, for longitude (−3ʰ 56ᵐ west, or plus)		+ 0	39
Sum (having regard to signs) is equal to local sidereal time .	19	34	51
R. A. of Polaris (page 281) for time of observation . . .	1	32	13
Remainder is equal to hour-angle of Polaris	18	2	38
Decl. of Polaris (page 281) for time of observation, 88° 52′ 17″ .			
	°	′	″
True altitude	+33	20	0
Correction from Table I		− 0	7
Correction from Table Ia			−13
Latitude of the place	+33	19	40

Observations of Polaris for latitude should be made when practicable near the times of upper or of lower culminations (hour-angle 0ʰ or 12ʰ). However, at sea, if made near elongation (hour-angle 6ʰ or 18ʰ), the hour-angle, and hence the local time, should be known within one minute.

H. A. \ Decl.	88° 52′ 10″		88° 52′ 20″		88° 52′ 30″		88° 52′ 40″		88° 52′ 50″		88° 53′ 0″		Decl. / H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
0 0	−67 50	0	−67 40	0	−67 30	0	−67 20	0	−67 10	0	−67 0	0	24 0
3	67 50	1	67 40	1	67 30	1	67 20	1	67 10	1	67 0	1	23 57
6	67 49	2	67 39	2	67 29	2	67 19	2	67 9	2	66 59	2	54
9	67 47	3	67 37	3	67 27	3	67 17	3	67 7	3	66 57	3	51
12	67 44	3	67 34	3	67 24	3	67 14	3	67 4	3	66 54	3	48
0 15	−67 41	4	−67 31	4	−67 21	4	−67 11	4	−67 1	4	−66 51	4	23 45
18	67 37	4	67 27	4	67 17	4	67 7	4	66 57	4	66 47	4	42
21	67 33	6	67 23	6	67 13	6	67 3	6	66 53	5	66 43	5	39
24	67 27	6	67 17	6	67 7	6	66 57	6	66 48	6	66 38	6	36
27	67 21	7	67 11	7	67 1	6	66 51	6	66 42	7	66 32	7	33
0 30	−67 14	7	−67 4	7	−66 55	8	−66 45	8	−66 35	8	−66 25	7	23 30
33	67 7	8	66 57	8	66 47	8	66 37	8	66 27	8	66 18	8	27
36	66 59	9	66 49	9	66 39	9	66 29	8	66 19	8	66 10	9	24
39	66 50	9	66 40	9	66 30	9	66 21	10	66 11	10	66 1	10	21
42	66 41	11	66 31	11	66 21	10	66 11	10	66 1	10	65 51	10	18
0 45	−66 30	11	−66 20	11	−66 11	11	−66 1	11	−65 51	11	−65 41	11	23 15
48	66 19	11	66 9	11	66 0	12	65 50	12	65 40	11	65 30	11	12
51	66 8	13	65 58	12	65 48	12	65 38	12	65 29	12	65 19	12	9
54	65 55	13	65 46	13	65 36	13	65 26	13	65 17	13	65 7	13	6
0 57	65 42	13	65 33	14	65 23	14	65 13	13	65 4	14	64 54	14	3
1 0	−65 29	15	−65 19	14	−65 9	14	−65 0	15	−64 50	14	−64 40	14	23 0
3	65 14	15	65 5	15	64 55	15	64 45	15	64 36	15	64 26	15	22 57
6	64 59	16	64 50	16	64 40	16	64 30	15	64 21	16	64 11	15	54
9	64 43	16	64 34	16	64 24	16	64 15	16	64 5	16	63 56	16	51
1 12	−64 27		−64 18		−64 8		−63 59		−63 49		−63 40		22 48

TABLE I.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1911

Decl. / H. A.	88° 52′ 10″		88° 52′ 20″		88° 52′ 30″		88° 52′ 40″		88° 52′ 50″		88° 53′ 0″		Decl. / H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
1 12	−64 27	17	−64 18	18	−64 8	17	−63 59	17	−63 49	17	−63 40	17	22 48
15	64 10	18	64 0	17	63 51	18	63 42	18	63 32	18	63 23	18	45
18	63 52	18	63 43	19	63 33	18	63 24	18	63 14	18	63 5	18	42
21	63 34	19	63 24	19	63 15	19	63 6	19	62 56	19	62 47	19	39
24	63 15	20	63 5	19	62 56	20	62 47	20	62 37	19	62 28	20	36
1 27	−62 55	21	−62 46	21	−62 36	20	−62 27	20	−62 18	20	−62 8	20	22 33
30	62 34	21	62 25	21	62 16	21	62 7	21	61 58	21	61 48	21	30
33	62 13	21	62 4	22	61 55	22	61 46	22	61 37	22	61 27	21	27
36	61 52	23	61 42	22	61 33	22	61 24	22	61 15	22	61 6	22	24
39	61 29	23	61 20	23	61 11	23	61 2	23	60 53	23	60 44	23	21
1 42	−61 6	24	−60 57	23	−60 48	23	−60 39	23	−60 30	23	−60 21	23	22 18
45	60 42	24	60 34	25	60 25	24	60 16	24	60 7	24	59 58	24	15
48	60 18	25	60 9	25	60 1	25	59 52	25	59 43	25	59 34	25	12
51	59 53	25	59 44	25	59 36	26	59 27	25	59 18	25	59 9	25	9
54	59 28	26	59 19	26	59 10	26	59 2	26	58 53	26	58 44	26	6
1 57	−59 2	27	−58 53	27	−58 44	26	−58 36	27	−58 27	27	−58 18	26	22 3
2 0	58 35	28	58 26	27	58 18	28	58 9	27	58 0	27	57 52	27	22 0
3	58 7	28	57 59	28	57 50	28	57 42	28	57 33	27	57 25	28	21 57
6	57 39	28	57 31	29	57 22	28	57 14	28	57 6	29	56 57	28	54
9	57 11	29	57 2	29	56 54	29	56 46	29	56 37	29	56 29	29	51
2 12	−56 42	30	−56 33	29	−56 25	30	−56 17	30	−56 8	29	−56 0	29	21 48
15	56 12	31	56 4	31	55 55	30	55 47	30	55 39	30	55 31	30	45
18	55 41	31	55 33	31	55 25	31	55 17	31	55 9	31	55 1	31	42
21	55 10	31	55 2	31	54 54	31	54 46	31	54 38	31	54 30	31	39
24	54 39	32	54 31	32	54 23	32	54 15	32	54 7	32	53 59	32	36
2 27	−54 7	33	−53 59	33	−53 51	33	−53 43	32	−53 35	32	−53 27	32	21 33
30	53 34	33	53 26	33	53 18	33	53 11	33	53 3	33	52 55	33	30
33	53 1	34	52 53	34	52 45	33	52 38	34	52 30	34	52 22	33	27
36	52 27	34	52 19	34	52 12	34	52 4	34	51 56	34	51 49	34	24
39	51 53	35	51 45	34	51 38	35	51 30	35	51 22	34	51 15	34	21
2 42	−51 18	35	−51 11	36	−51 3	35	−50 55	35	−50 48	35	−50 41	35	21 18
45	50 43	36	50 35	36	50 28	36	50 20	35	50 13	36	50 6	36	15
48	50 7	37	49 59	36	49 52	36	49 45	36	49 37	36	49 30	36	12
51	49 30	37	49 23	37	49 16	37	49 9	37	49 1	36	48 54	36	9
54	48 53	37	48 46	37	48 39	37	48 32	37	48 25	37	48 18	37	6
2 57	−48 16	38	−48 9	38	−48 2	38	−47 55	38	−47 48	38	−47 41	38	21 3
3 0	47 38	38	47 31	38	47 24	38	47 17	38	47 10	38	47 3	38	21 0
3	47 0	39	46 53	39	46 46	39	46 39	30	46 32	38	46 25	38	20 57
6	46 21	40	46 14	39	46 7	39	46 0	39	45 54	39	45 47	39	54
9	45 41	40	45 35	40	45 28	40	45 21	39	45 15	40	45 8	40	51
3 12	−45 1	40	−44 55	40	−44 48	40	−44 42	40	−44 35	40	−44 28	39	20 48
15	44 21	41	44 15	41	44 8	41	44 2	41	43 55	40	43 49	41	45
18	43 40	41	43 34	41	43 27	41	43 21	41	43 15	41	43 8	40	42
21	42 59	42	42 53	42	42 46	41	42 40	41	42 34	41	42 28	42	39
24	42 17	42	42 11	42	42 5	42	41 59	42	41 53	42	41 46	41	36
3 27	−41 35	42	−41 29	42	−41 23	42	−41 17	42	−41 11	42	−41 5	42	20 33
30	40 53	43	40 47	43	40 41	43	40 35	43	40 29	43	40 23	43	30
33	40 10	44	40 4	43	39 58	43	39 52	43	39 46	43	39 40	43	27
36	39 26	44	39 21	44	39 15	44	39 9	43	39 8	43	38 57	43	24
39	38 42	44	38 37	44	38 31	44	38 26	44	38 20	44	38 14	43	21
3 42	−37 58	44	−37 53	45	−37 47	44	−37 42	45	−37 36	44	−37 31	44	20 18
45	37 14	45	37 8	45	37 3	45	36 57	44	36 52	45	36 47	45	15
48	36 29	46	36 23	45	36 18	45	36 13	45	36 7	45	36 2	45	12
51	35 43	45	35 38	45	35 33	46	35 28	46	35 22	45	35 17	45	9
54	34 58	46	34 53	46	34 47	45	34 42	45	34 37	45	34 32	45	6
3 57	−34 12	47	−34 7	47	−34 2	47	−33 57	46	−33 52	46	−33 47	46	20 3
4 0	33 25	47	33 20	46	33 15	46	33 11	47	33 6	47	33 1	46	20 0
3	32 38	47	32 34	47	32 29	47	32 24	47	32 19	46	32 15	47	19 57
6	31 51	47	31 47	48	31 42	47	31 37	47	31 33	47	31 28	47	54
4 9	−31 4		−30 59		−30 55		−30 50		−30 46		−30 41		19 51

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1919.

Decl. H. A.	88° 52′ 10″		88° 52′ 20″		88° 52′ 30″		88° 52′ 40″		88° 52′ 50″		88° 53′ 0″		Decl. H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
4 9	−31 4	48	−30 59	47	−30 55	48	−30 50	47	−30 46	47	−30 41	47	19 51
12	30 16	48	30 12	48	30 7	48	30 8	48	29 59	48	29 54	47	48
15	29 28	48	29 24	48	29 19	48	29 15	48	29 11	48	29 7	48	45
18	28 40	49	28 36	49	28 31	48	28 27	48	28 23	48	28 19	48	42
21	27 51	49	27 47	49	27 43	49	27 39	49	27 35	49	27 31	48	39
4 24	−27 2	49	−26 58	49	−26 54	49	−26 50	49	−26 46	48	−26 43	49	19 36
27	26 13	49	26 9	49	26 5	49	26 1	49	25 58	49	25 54	49	33
30	25 24	50	25 20	50	25 16	49	25 12	49	25 9	49	25 5	49	30
33	24 34	50	24 30	50	24 27	50	24 23	49	24 20	50	24 16	49	27
36	23 44	50	23 40	50	23 37	50	23 34	50	23 30	50	23 27	50	24
4 39	−22 54	51	−22 50	50	−22 47	50	−22 44	50	−22 40	50	−22 37	50	19 21
42	22 3	50	22 0	51	21 57	51	21 54	51	21 50	50	21 47	50	18
45	21 13	51	21 9	50	21 6	50	21 3	50	21 0	50	20 57	50	15
48	20 22	51	20 19	51	20 16	51	20 13	51	20 10	51	20 7	50	12
51	19 31	52	19 28	51	19 25	51	19 22	51	19 19	50	19 17	51	9
4 54	−18 39	51	−18 37	52	−18 34	51	−18 31	51	−18 29	51	−18 26	51	19 6
4 57	17 48	52	17 45	51	17 43	52	17 40	51	17 38	52	17 35	51	3
5 0	16 56	52	16 54	52	16 51	51	16 49	52	16 46	51	16 44	51	19 0
3	16 4	52	16 2	52	16 0	52	15 57	51	15 55	51	15 53	51	18 57
6	15 12	52	15 10	52	15 8	52	15 6	52	15 4	52	15 2	52	54
5 9	−14 20	52	−14 18	52	−14 16	52	−14 14	52	−14 12	52	−14 10	52	18 51
12	13 28	52	13 26	52	13 24	52	13 22	52	13 20	52	13 18	51	48
15	12 36	53	12 34	53	12 32	52	12 30	52	12 28	52	12 27	52	45
18	11 43	53	11 41	52	11 40	53	11 38	52	11 36	52	11 35	52	42
21	10 50	52	10 49	53	10 47	52	10 46	52	10 44	52	10 43	52	39
5 24	− 9 58	53	− 9 56	52	− 9 55	53	− 9 54	53	− 9 52	52	− 9 51	53	18 36
27	9 5	53	9 4	53	9 2	52	9 1	53	9 0	53	8 58	52	33
30	8 12	53	8 11	53	8 10	53	8 8	52	8 7	52	8 6	52	30
33	7 19	53	7 18	53	7 17	53	7 16	53	7 15	53	7 14	53	27
36	6 26	53	6 25	53	6 24	53	6 23	53	6 22	52	6 21	52	24
5 39	− 5 33	53	− 5 32	53	− 5 31	53	− 5 30	52	− 5 30	53	− 5 29	53	18 21
42	4 40	54	4 39	53	4 38	53	4 38	53	4 37	53	4 36	52	18
45	3 46	53	3 46	53	3 45	53	3 45	53	3 44	52	3 44	53	15
48	2 53	53	2 53	53	2 52	53	2 52	53	2 52	53	2 51	52	12
51	2 0	54	2 0	54	1 59	53	1 59	53	1 59	53	1 59	53	9
5 54	− 1 6	53	− 1 6	53	− 1 6	53	− 1 6	53	− 1 6	53	− 1 6	53	18 6
5 57	− 0 13	53	− 0 13	53	− 0 13	53	− 0 13	53	− 0 13	52	− 0 13	52	3
6 0	+ 0 40	53	+ 0 40	53	+ 0 40	53	+ 0 40	52	+ 0 39	53	+ 0 39	53	18 0
3	1 33	54	1 33	53	1 33	53	1 32	53	1 32	53	1 32	52	17 57
6	2 27	53	2 26	53	2 26	53	2 25	53	2 25	53	2 24	53	54
6 9	+ 3 20	53	+ 3 19	53	+ 3 19	53	+ 3 18	53	+ 3 18	52	+ 3 17	52	17 51
12	4 13	53	4 12	53	4 12	52	4 11	53	4 10	53	4 9	53	48
15	5 6	53	5 5	53	5 4	53	5 4	52	5 3	52	5 2	52	45
18	5 59	53	5 58	53	5 57	53	5 56	53	5 55	53	5 54	53	42
21	6 52	53	6 51	53	6 50	53	6 49	52	6 48	52	6 47	52	39
6 24	+ 7 45	53	+ 7 44	53	+ 7 43	52	+ 7 41	53	+ 7 40	53	+ 7 39	52	17 36
27	8 38	53	8 37	52	8 35	53	8 34	52	8 33	52	8 31	52	33
30	9 31	52	9 29	53	9 28	52	9 26	53	9 25	52	9 23	52	30
33	10 23	53	10 22	52	10 20	52	10 19	52	10 17	52	10 15	52	27
36	11 16	52	11 14	52	11 12	53	11 11	52	11 9	52	11 7	52	24
6 39	+12 8	53	+12 6	53	+12 5	52	+12 3	52	+12 1	52	+11 59	52	17 21
42	13 1	52	12 59	52	12 57	51	12 55	51	12 53	51	12 51	51	18
45	13 53	52	13 51	51	13 48	52	13 46	52	13 44	52	13 42	51	15
48	14 45	52	14 42	52	14 40	52	14 38	51	14 36	51	14 33	52	12
51	15 37	51	15 34	52	15 32	51	15 29	52	15 27	51	15 25	51	9
6 54	+16 28	52	+16 26	51	+16 23	51	+16 21	51	+16 18	51	+16 16	50	17 6
6 57	17 20	51	17 17	51	17 14	51	17 12	51	17 9	51	17 6	51	3
7 0	18 11	51	18 8	51	18 5	51	18 3	50	18 0	50	17 57	51	17 0
3	19 2	51	18 59	51	18 56	51	18 53	51	18 50	51	18 48	50	16 57
7 6	+19 53		+19 50		+19 47		+19 44		+19 41		+19 38		16 54

TABLE I.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, [illegible]

Decl. H. A.	88° 52′ 10″		88° 52′ 20″		88° 52′ 30″		88° 52′ 40″		88° 52′ 50″		88° 53′ 0″		Decl. H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
7 6	+19 53	51	+19 50	51	+19 47	50	+19 44	50	+19 41	50	+19 38	50	16 54
9	20 44	50	20 41	50	20 37	51	20 34	50	20 31	50	20 28	50	51
12	21 34	50	21 31	50	21 28	50	21 24	50	21 21	50	21 18	50	48
15	22 24	50	22 21	50	22 18	49	22 14	50	22 11	49	22 8	49	45
18	23 14	50	23 11	50	23 7	50	23 4	49	23 0	50	22 57	49	42
7 21	+24 4	50	+24 1	49	+23 57	49	+23 53	49	+23 50	49	+23 46	49	16 39
24	24 54	49	24 50	49	24 46	49	24 42	49	24 39	49	24 35	49	36
27	25 43	49	25 39	49	25 35	49	25 31	49	25 28	48	25 24	48	33
30	26 32	49	26 28	49	26 24	48	26 20	48	26 16	48	26 12	48	30
33	27 21	48	27 17	48	27 12	49	27 8	48	27 4	48	27 0	48	27
7 36	+28 9	48	+28 5	48	+28 1	48	+27 56	48	+27 52	48	+27 48	48	16 24
39	28 57	48	28 53	48	28 49	47	28 44	48	28 40	47	28 36	47	21
42	29 45	48	29 41	47	29 36	47	29 32	47	29 27	47	29 23	47	18
45	30 33	47	30 28	47	30 23	47	30 19	47	30 14	47	30 10	46	15
48	31 20	47	31 15	47	31 10	47	31 6	46	31 1	46	30 56	47	12
7 51	+32 7	46	+32 2	46	+31 57	46	+31 52	46	+31 47	46	+31 43	46	16 9
54	32 53	46	32 48	46	32 43	46	32 38	46	32 33	46	32 29	45	6
7 57	33 39	46	33 34	46	33 29	46	33 24	46	33 19	46	33 14	46	3
8 0	34 25	46	34 20	46	34 15	45	34 10	45	34 5	45	34 0	45	16 0
3	35 11	45	35 6	45	35 0	45	34 55	45	34 50	44	34 45	44	15 57
8 6	+35 56	45	+35 51	44	+35 45	45	+35 40	44	+35 34	45	+35 29	44	15 54
9	36 41	44	36 35	44	36 30	44	36 24	44	36 19	44	36 13	44	51
12	37 25	44	37 19	44	37 14	44	37 8	44	37 3	43	36 57	44	48
15	38 9	44	38 3	44	37 58	43	37 52	43	37 46	43	37 41	43	45
18	38 53	43	38 47	43	38 41	43	38 35	43	38 29	43	38 24	43	42
8 21	+39 36	43	+39 30	43	+39 24	43	+39 18	43	+39 12	43	+39 7	42	15 39
24	40 19	42	40 13	42	40 7	42	40 1	42	39 55	42	39 49	42	36
27	41 1	42	40 55	42	40 49	42	40 43	42	40 37	41	40 31	41	33
30	41 43	42	41 37	41	41 31	41	41 25	41	41 18	41	41 12	41	30
33	42 25	41	42 18	41	42 12	41	42 6	41	41 59	41	41 53	41	27
8 36	+43 6	41	+42 59	41	+42 53	40	+42 47	40	+42 40	40	+42 34	40	15 24
39	43 47	40	43 40	40	43 33	40	43 27	40	43 20	40	43 14	40	21
42	44 27	40	44 20	40	44 13	40	44 7	39	44 0	40	43 54	39	18
45	45 7	39	45 0	39	44 53	39	44 46	39	44 40	39	44 33	39	15
48	45 46	39	45 39	39	45 32	39	45 25	39	45 19	38	45 12	38	12
8 51	+46 25	38	+46 18	38	+46 11	38	+46 4	38	+45 57	38	+45 50	38	15 9
54	47 3	38	46 56	38	46 49	38	46 42	38	46 35	38	46 28	37	6
8 57	47 41	37	47 34	37	47 27	37	47 20	37	47 13	37	47 5	37	3
9 0	48 18	37	48 11	37	48 4	37	47 57	36	47 50	36	47 42	37	15 0
3	48 55	36	48 48	36	48 41	36	48 33	36	48 26	36	48 19	36	14 57
9 6	+49 31	36	+49 24	36	+49 17	36	+49 9	36	+49 2	36	+48 55	35	14 54
9	50 7	36	50 0	35	49 53	35	49 45	35	49 38	35	49 30	35	51
12	50 43	35	50 35	35	50 28	34	50 20	35	50 13	34	50 5	35	48
15	51 18	34	51 10	34	51 2	35	50 55	34	50 47	34	50 40	34	45
18	51 52	34	51 44	34	51 37	33	51 29	33	51 21	34	51 14	33	42
9 21	+52 26	33	+52 18	33	+52 10	33	+52 2	33	+51 55	33	+51 47	33	14 39
24	52 59	33	52 51	33	52 43	33	52 35	33	52 28	32	52 20	32	36
27	53 32	32	53 24	32	53 16	32	53 8	32	53 0	32	52 52	32	33
30	54 4	32	53 56	32	53 48	31	53 40	31	53 32	31	53 24	31	30
33	54 36	31	54 28	31	54 19	31	54 11	31	54 3	31	53 55	31	27
9 36	+55 7	30	+54 59	30	+54 50	31	+54 42	30	+54 34	30	+54 26	30	14 24
39	55 37	30	55 29	30	55 21	30	55 12	30	55 4	30	54 56	30	21
42	56 7	30	55 59	29	55 51	29	55 42	29	55 34	29	55 26	29	18
45	56 37	29	56 28	29	56 20	29	56 11	29	56 3	29	55 55	28	15
48	57 6	28	56 57	28	56 49	28	56 40	28	56 32	28	56 23	28	12
9 51	+57 34	27	+57 25	28	+57 17	27	+57 8	28	+57 0	27	+56 51	27	14 9
54	58 1	27	57 53	27	57 44	27	57 36	27	57 27	27	57 18	27	6
9 57	58 28	27	58 20	26	58 11	26	58 3	26	57 54	26	57 45	26	3
10 0	58 55	26	58 46	26	58 37	26	58 29	25	58 20	26	58 11	26	14 0
10 3	+59 21		+59 12		+59 3		+58 54		+58 46		+58 37		13 57

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1919.

H. A. / Decl.	88° 52′ 10″		88° 52′ 20″		88° 52′ 30″		88° 52′ 40″		88° 52′ 50″		88° 53° 0″		Decl. / H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
10 3	+59 21	25	+59 12	25	+59 3	25	+58 54	25	+58 46	25	+58 37	25	13 57
6	59 46	25	59 37	25	59 28	25	59 19	25	59 11	24	59 2	24	54
9	60 11	24	60 2	24	59 53	24	59 44	24	59 35	24	59 26	24	51
12	60 35	23	60 26	23	60 17	23	60 8	23	59 59	23	59 50	23	48
15	60 58	23	60 49	23	60 40	23	60 31	23	60 22	23	60 13	23	45
10 18	+61 21	22	+61 12	22	+61 3	22	+60 54	22	+60 45	22	+60 36	22	13 42
21	61 43	22	61 34	22	61 25	21	61 16	21	61 7	21	60 58	21	39
24	62 5	21	61 56	21	61 46	21	61 37	21	61 28	21	61 19	21	36
27	62 26	20	62 17	20	62 7	21	61 58	20	61 49	20	61 40	20	33
30	62 46	20	62 37	20	62 28	19	62 18	20	62 9	20	62 0	19	30
10 33	+63 6	19	+62 57	19	+62 47	19	+62 38	19	+62 29	18	+62 19	19	13 27
36	63 25	18	63 16	18	63 6	18	62 57	18	62 47	19	62 38	18	24
39	63 43	18	63 34	18	63 24	18	63 15	18	63 6	17	62 56	18	21
42	64 1	17	63 52	17	63 42	17	63 33	17	63 23	17	63 14	17	18
45	64 18	17	64 9	16	63 59	17	63 50	16	63 40	17	63 31	16	15
10 48	+64 35	16	+64 25	16	+64 16	15	+64 6	16	+63 57	15	+63 47	16	13 12
51	64 51	15	64 41	15	64 31	15	64 22	15	64 12	15	64 3	15	9
54	65 6	14	64 56	15	64 46	15	64 37	14	64 27	15	64 18	14	6
10 57	65 20	14	65 11	13	65 1	14	64 51	14	64 42	13	64 32	14	3
11 0	65 34	13	65 24	14	65 15	13	65 5	13	64 55	13	64 46	13	13 0
11 3	+65 47	13	+65 38	12	+65 28	12	+65 18	13	+65 8	13	+64 59	12	12 57
6	66 0	12	65 50	12	65 40	12	65 31	11	65 21	12	65 11	12	54
9	66 12	11	66 2	11	65 52	11	65 42	11	65 33	11	65 23	11	51
12	66 23	10	66 13	11	66 3	11	65 53	11	65 44	10	65 34	10	48
15	66 33	10	66 24	9	66 14	10	66 4	10	65 54	10	65 44	10	45
11 18	+66 43	9	+66 33	9	+66 24	9	+66 14	9	+66 4	9	+65 54	9	12 42
21	66 52	9	66 42	9	66 33	8	66 23	8	66 13	8	66 3	8	39
24	67 1	8	66 51	8	66 41	8	66 31	8	66 21	8	66 11	8	36
27	67 9	7	66 59	7	66 49	7	66 39	7	66 29	7	66 19	7	33
30	67 16	6	67 6	6	66 56	6	66 46	6	66 36	7	66 26	7	30
11 33	+67 22	6	+67 12	6	+67 2	6	+66 52	6	+66 43	5	+66 33	5	12 27
36	67 28	5	67 18	5	67 8	5	66 58	5	66 48	5	66 38	5	24
39	67 33	5	67 23	5	67 13	5	67 3	5	66 53	5	66 43	5	21
42	67 38	3	67 28	3	67 18	3	67 8	4	66 58	4	66 48	4	18
45	67 41	3	67 31	3	67 21	3	67 12	3	67 2	3	66 52	3	15
11 48	+67 44	3	+67 34	3	+67 24	3	+67 15	2	+67 5	2	+66 55	2	12 12
51	67 47	2	67 37	2	67 27	2	67 17	2	67 7	2	66 57	2	9
54	67 49	1	67 39	1	67 29	1	67 19	1	67 9	1	66 59	1	6
11 57	67 50	0	67 40	0	67 30	0	67 20	0	67 10	0	67 0	0	3
12 0	+67 50		+67 40		+67 30		+67 20		+67 10		+67 0		12 0

TABLE Ia.

Table I has been computed for an altitude of 45°. For other altitudes, corrections taken from the following table may be applied when the desired degree of accuracy requires it.

H. A. / Altitude.		10°	20°	30°	40°	50°	60°	70°	Altitude. / H. A.	
h	h	″	″	″	″	″	″	″	h	h
0	12	0	0	0	0	0	0	0	12	24
1	11	− 2	− 2	− 1	0	+1	+ 2	+ 5	13	23
2	10	8	6	4	−2	2	7	17	14	22
3	9	16	13	8	3	4	14	35	15	21
4	8	24	19	13	5	6	22	52	16	20
5	7	30	23	16	6	7	27	65	17	19
6	6	−33	−25	−17	−6	+8	+29	+69	18	18

TABLE II.

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	Per Seconds	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0	0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1	0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2	0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3	0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4	0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5	0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6	0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7	0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8	0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9	0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10	0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11	0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12	0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13	0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14	0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15	0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16	0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17	0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18	0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19	0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20	0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21	0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22	0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23	0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24	0.065
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25	0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26	0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27	0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28	0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29	0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30	0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31	0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32	0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33	0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34	0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35	0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36	0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37	0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38	0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39	0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40	0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41	0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42	0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43	0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44	0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45	0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46	0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47	0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48	0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49	0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50	0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51	0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52	0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53	0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54	0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55	0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56	0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57	0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58	0.158
59	*0 9.666*	*0 19.495*	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59	0.161

TABLE II.

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

idereal.	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0	0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2	0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3	0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4	0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5	0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6	0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7	0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8	0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9	0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10	0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11	0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12	0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16	0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20	0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21	0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27	0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38	0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43	0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47	0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54	0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59	0.161

TABLE II.

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0	0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48	0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51	0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161

TABLE III.

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0	0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1	0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2	0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3	0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4	0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5	0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6	0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7	0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8	0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9	0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10	0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11	0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12	0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13	0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14	0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15	0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16	0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17	0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18	0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19	0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20	0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21	0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22	0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23	0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24	0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25	0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26	0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27	0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28	0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29	0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30	0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31	0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32	0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33	0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34	0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35	0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36	0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37	0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38	0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39	0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40	0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41	0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42	0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43	0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44	0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45	0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46	0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47	0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48	0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49	0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50	0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51	0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52	0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53	0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54	0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55	0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56	0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57	0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58	0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59	0.162

TABLE III.

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0	0.000
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1	0.003
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2	0.005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3	0.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4	0.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5	0.014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6	0.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7	0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8	0.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9	0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10	0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11	0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2.29.818	12	0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13	0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14	0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15	0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16	0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17	0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18	0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19	0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20	0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21	0.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22	0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23	0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24	0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25	0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26	0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27	0.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28	0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29	0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30	0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31	0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32	0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33	0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34	0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35	0.096
36	1 24.766	1 34.622	1 44 479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36	0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37	0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38	0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39	0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40	0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41	0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42	0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43	0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44	0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45	0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46	0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47	0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48	0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49	0.134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50	0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51	0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52	0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53	0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54	0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55	0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56	0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57	0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58	0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.162

TABLE III.

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	16h	17h	18h	19h	20h	21h	22h	23h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0	0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44	0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49	0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1919.

[For hour angles 0ʰ to 12ʰ the star is west of north, and for hour angles 12ʰ to 24ʰ it is east of north.]

Lat. H. A.	10°	15°	20°	22°	24°	26°	28°	30°	32°	Lat. H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
10	0 3.0	0 3.0	0 3.1	0 3.2	0 3.2	0 3.3	0 3.4	0 3.4	0 3.5	23 50
20	0 6.0	0 6.1	0 6.3	0 6.4	0 6.5	0 6.6	0 6.7	0 6.8	0 7.0	40
0 30	0 9.0	0 9.1	0 9.4	0 9.6	0 9.7	0 9.9	0 10.1	0 10.3	0 10.5	23 30
40	0 11.9	0 12.2	0 12.5	0 12.7	0 12.9	0 13.1	0 13.4	0 13.6	0 13.9	20
50	0 14.8	0 15.2	0 15.6	0 15.8	0 16.1	0 16.4	0 16.7	0 17.0	0 17.4	10
1 0	0 17.7	0 18.1	0 18.7	0 18.9	0 19.2	0 19.6	0 19.9	0 20.3	0 20.8	23 0
10	0 20.6	0 21.1	0 21.7	0 22.0	0 22.3	0 22.7	0 23.1	0 23.6	0 24.2	22 50
20	0 23.5	0 24.0	0 24.7	0 25.0	0 25.4	0 25.8	0 26.3	0 26.9	0 27.5	40
1 30	0 26.3	0 26.8	0 27.6	0 28.0	0 28.4	0 28.9	0 29.5	0 30.1	0 30.7	22 30
40	0 29.0	0 29.6	0 30.5	0 30.9	0 31.4	0 31.9	0 32.5	0 33.2	0 33.9	20
50	0 31.7	0 32.3	0 33.3	0 33.8	0 34.3	0 34.9	0 35.5	0 36.3	0 37.0	10
2 0	0 34.3	0 35.0	0 36.0	0 36.6	0 37.1	0 37.8	0 38.5	0 39.3	0 40.1	22 0
10	0 36.8	0 37.6	0 38.7	0 39.3	0 39.9	0 40.6	0 41.3	0 42.2	0 43.1	21 50
20	0 39.3	0 40.2	0 41.3	0 41.9	0 42.6	0 43.3	0 44.1	0 45.0	0 46.0	40
2 30	0 41.7	0 42.6	0 43.9	0 44.5	0 45.2	0 46.0	0 46.8	0 47.8	0 48.8	21 30
40	0 44.1	0 45.0	0 46.3	0 47.0	0 47.7	0 48.5	0 49.4	0 50.4	0 51.5	20
50	0 46.3	0 47.3	0 48.7	0 49.4	0 50.1	0 51.0	0 51.9	0 53.0	0 54.1	10
3 0	0 48.5	0 49.5	0 50.9	0 51.6	0 52.4	0 53.3	0 54.3	0 55.4	0 56.6	21 0
10	0 50.5	0 51.6	0 53.1	0 53.8	0 54.7	0 55.6	0 56.6	0 57.7	0 59.0	20 50
20	0 52.5	0 53.6	0 55.2	0 55.9	0 56.8	0 57.7	0 58.8	1 0.0	1 1.3	40
3 30	0 54.4	0 55.5	0 57.1	0 57.9	0 58.8	0 59.8	1 0.9	1 2.1	1 3.5	20 30
40	0 56.1	0 57.3	0 58.9	0 59.8	1 0.7	1 1.7	1 2.9	1 4.1	1 5.5	20
50	0 57.8	0 59.0	1 0.7	1 1.5	1 2.5	1 3.5	1 4.7	1 6.0	1 7.4	10
4 0	0 59.3	1 0.5	1 2.3	1 3.1	1 4.1	1 5.2	1 6.4	1 7.7	1 9.2	20 0
10	1 0.7	1 2.0	1 3.8	1 4.6	1 5.6	1 6.7	1 8.0	1 9.3	1 10.8	19 50
20	1 2.1	1 3.3	1 5.1	1 6.0	1 7.0	1 8.2	1 9.4	1 10.8	1 12.3	40
4 30	1 3.3	1 4.5	1 6.4	1 7.3	1 8.3	1 9.5	1 10.7	1 12.1	1 13.7	19 30
40	1 4.3	1 5.6	1 7.5	1 8.4	1 9.5	1 10.6	1 11.9	1 13.3	1 14.9	20
50	1 5.3	1 6.6	1 8.5	1 9.4	1 10.5	1 11.6	1 13.0	1 14.4	1 16.0	10
5 0	1 6.1	1 7.4	1 9.3	1 10.3	1 11.4	1 12.5	1 13.9	1 15.3	1 16.9	19 0
10	1 6.8	1 8.1	1 10.1	1 11.0	1 12.1	1 13.3	1 14.6	1 16.1	1 17.7	18 50
20	1 7.4	1 8.7	1 10.7	1 11.6	1 12.7	1 13.9	1 15.2	1 16.7	1 18.3	40
5 30	1 7.8	1 9.2	1 11.1	1 12.1	1 13.2	1 14.4	1 15.7	1 17.2	1 18.8	18 30
40	1 8.1	1 9.5	1 11.4	1 12.4	1 13.5	1 14.7	1 16.0	1 17.5	1 19.2	20
50	1 8.3	1 9.7	1 11.6	1 12.6	1 13.7	1 14.9	1 16.2	1 17.7	1 19.4	10
6 0	1 8.4	1 9.7	1 11.7	1 12.6	1 13.7	1 14.9	1 16.3	1 17.7	1 19.4	18 0
10	1 8.3	1 9.6	1 11.6	1 12.5	1 13.6	1 14.8	1 16.2	1 17.6	1 19.3	17 50
20	1 8.1	1 9.4	1 11.3	1 12.3	1 13.4	1 14.6	1 15.9	1 17.4	1 19.0	40
6 30	1 7.8	1 9.1	1 11.0	1 11.9	1 13.0	1 14.2	1 15.5	1 17.0	1 18.6	17 30
40	1 7.3	1 8.6	1 10.5	1 11.4	1 12.5	1 13.7	1 15.0	1 16.4	1 18.0	20
50	1 6.7	1 8.0	1 9.9	1 10.8	1 11.8	1 13.0	1 14.3	1 15.7	1 17.3	10
7 0	1 6.0	1 7.2	1 9.1	1 10.0	1 11.0	1 12.2	1 13.5	1 14.9	1 16.4	17 0
10	1 5.2	1 6.4	1 8.2	1 9.1	1 10.1	1 11.2	1 12.5	1 13.9	1 15.4	16 50
20	1 4.2	1 5.4	1 7.2	1 8.1	1 9.0	1 10.2	1 11.4	1 12.8	1 14.3	40
7 30	1 3.1	1 4.3	1 6.0	1 6.9	1 7.9	1 9.0	1 10.2	1 11.5	1 13.0	16 30
40	1 1.9	1 3.0	1 4.7	1 5.6	1 6.6	1 7.6	1 8.8	1 10.1	1 11.6	20
50	1 0.6	1 1.7	1 3.3	1 4.2	1 5.1	1 6.2	1 7.3	1 8.6	1 10.0	10
8 0	0 59.1	1 0.2	1 1.8	1 2.6	1 3.6	1 4.6	1 5.7	1 7.0	1 8.3	16 0
10	0 57.6	0 58.6	1 0.2	1 1.0	1 1.9	1 2.9	1 4.0	1 5.2	1 6.5	15 50
20	0 55.9	0 56.9	0 58.5	0 59.2	1 0.1	1 1.0	1 2.1	1 3.3	1 4.6	40
8 30	0 54.1	0 55.1	0 56.6	0 57.3	0 58.2	0 59.1	1 0.1	1 1.3	1 2.5	15 30
40	0 52.3	0 53.2	0 54.6	0 55.3	0 56.1	0 57.0	0 58.0	0 59.1	1 0.3	20
50	0 50.3	0 51.2	0 52.6	0 53.2	0 54.0	0 54.9	0 55.8	0 56.9	0 58.0	10
9 0	0 48.2	0 49.1	0 50.4	0 51.1	0 51.8	0 52.6	0 53.5	0 54.5	0 55.7	15 0

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1919.

[For hour angles 0h to 12h the star is west of north, and for hour angles 12h to 24h it is east of north.]

Lat. / H. A.	10°	15°	20°	22°	24°	26°	28°	30°	32°	Lat. / H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
9 0	0 48.2	0 49.1	0 50.4	0 51.1	0 51.8	0 52.6	0 53.5	0 54.5	0 55.7	15 0
10	0 46.1	0 46.9	0 48.1	0 48.8	0 49.5	0 50.2	0 51.1	0 52.1	0 53.2	14 50
20	0 43.8	0 44.6	0 45.8	0 46.4	0 47.0	0 47.8	0 48.6	0 49.5	0 50.6	40
9 30	0 41.5	0 42.3	0 43.4	0 43.9	0 44.6	0 45.3	0 46.0	0 46.9	0 47.9	14 30
40	0 39.1	0 39.8	0 40.9	0 41.4	0 42.0	0 42.6	0 43.4	0 44.2	0 45.1	20
50	0 36.6	0 37.3	0 38.3	0 38.8	0 39.3	0 39.9	0 40.6	0 41.4	0 42.2	10
10 0	0 34.1	0 34.7	0 35.6	0 36.1	0 36.6	0 37.2	0 37.8	0 38.5	0 39.3	14 0
10	0 31.5	0 32.0	0 32.9	0 33.3	0 33.8	0 34.3	0 34.9	0 35.5	0 36.3	13 50
20	0 28.8	0 29.3	0 30.1	0 30.5	0 30.9	0 31.4	0 31.9	0 32.5	0 33.2	40
10 30	0 26.1	0 26.5	0 27.2	0 27.6	0 28.0	0 28.4	0 28.9	0 29.4	0 30.0	13 30
40	0 23.3	0 23.7	0 24.3	0 24.7	0 25.0	0 25.4	0 25.8	0 26.3	0 26.8	20
50	0 20.5	0 20.8	0 21.4	0 21.7	0 22.0	0 22.3	0 22.7	0 23.1	0 23.6	10
11 0	0 17.7	0 17.9	0 18.4	0 18.7	0 18.9	0 19.2	0 19.5	0 19.9	0 20.3	13 0
10	0 14.8	0 15.0	0 15.4	0 15.6	0 15.8	0 16.1	0 16.3	0 16.6	0 17.0	12 50
20	0 11.8	0 12.1	0 12.3	0 12.5	0 12.7	0 12.9	0 13.1	0 13.3	0 13.6	40
11 30	0 8.9	0 9.1	0 9.3	0 9.4	0 9.5	0 9.7	0 9.8	0 10.0	0 10.2	12 30
40	0 5.9	0 6.0	0 6.2	0 6.3	0 6.4	0 6.5	0 6.6	0 6.7	0 6.8	20
50	0 3.0	0 3.0	0 3.1	0 3.1	0 3.2	0 3.2	0 3.3	0 3.4	0 3.4	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

Lat. / H. A.	32°	34°	36°	38°	40°	42°	44°	46°	48°	Lat. / H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
10	0 3.5	0 3.6	0 3.7	0 3.8	0 3.9	0 4.0	0 4.2	0 4.3	0 4.5	23 50
20	0 7.0	0 7.2	0 7.4	0 7.6	0 7.8	0 8.0	0 8.3	0 8.6	0 9.0	40
0 30	0 10.5	0 10.7	0 11.0	0 11.3	0 11.7	0 12.1	0 12.5	0 12.9	0 13.4	23 30
40	0 13.9	0 14.3	0 14.7	0 15.1	0 15.5	0 16.0	0 16.6	0 17.2	0 17.8	20
50	0 17.4	0 17.8	0 18.3	0 18.8	0 19.3	0 20.0	0 20.7	0 21.4	0 22.2	10
1 0	0 20.8	0 21.3	0 21.8	0 22.4	0 23.1	0 23.9	0 24.7	0 25.6	0 26.6	23 0
10	0 24.2	0 24.7	0 25.3	0 26.0	0 26.8	0 27.7	0 28.7	0 29.7	0 30.9	22 50
20	0 27.5	0 28.1	0 28.8	0 29.6	0 30.5	0 31.5	0 32.6	0 33.8	0 35.1	40
1 30	0 30.7	0 31.4	0 32.2	0 33.1	0 34.1	0 35.2	0 36.4	0 37.8	0 39.3	22 30
40	0 33.9	0 34.7	0 35.6	0 36.6	0 37.7	0 38.9	0 40.2	0 41.7	0 43.4	20
50	0 37.0	0 37.9	0 38.9	0 40.0	0 41.2	0 42.5	0 44.0	0 45.6	0 47.4	10
2 0	0 40.1	0 41.1	0 42.1	0 43.3	0 44.6	0 46.0	0 47.6	0 49.4	0 51.3	22 0
10	0 43.1	0 44.1	0 45.2	0 46.5	0 47.9	0 49.4	0 51.1	0 53.0	0 55.1	21 50
20	0 46.0	0 47.1	0 48.3	0 49.6	0 51.1	0 52.7	0 54.5	0 56.5	0 58.8	40
2 30	0 48.8	0 50.0	0 51.2	0 52.6	0 54.2	0 55.9	0 57.8	1 0.0	1 2.3	21 30
40	0 51.5	0 52.7	0 54.1	0 55.6	0 57.2	0 59.0	1 1.0	1 3.3	1 5.8	20
50	0 54.1	0 55.4	0 56.8	0 58.4	1 0.1	1 2.0	1 4.1	1 6.5	1 9.1	10
3 0	0 56.6	0 58.0	0 59.4	1 1.1	1 2.9	1 4.9	1 7.1	1 9.6	1 12.3	21 0
10	0 59.0	1 0.4	1 1.9	1 3.6	1 5.5	1 7.6	1 9.9	1 12.5	1 15.3	20 50
20	1 1.3	1 2.7	1 4.3	1 6.1	1 8.0	1 10.2	1 12.6	1 15.2	1 18.2	40
3 30	1 3.5	1 4.9	1 6.6	1 8.4	1 10.4	1 12.7	1 15.1	1 17.8	1 20.9	20 30
40	1 5.5	1 7.0	1 8.7	1 10.6	1 12.7	1 15.0	1 17.5	1 20.3	1 23.5	20
50	1 7.4	1 9.0	1 10.7	1 12.7	1 14.8	1 17.2	1 19.7	1 22.6	1 25.9	10
4 0	1 9.2	1 10.8	1 12.6	1 14.6	1 16.8	1 19.2	1 21.8	1 24.8	1 28.1	20 0
10	1 10.8	1 12.5	1 14.3	1 16.3	1 18.6	1 21.0	1 23.7	1 26.8	1 30.2	19 50
20	1 12.3	1 14.0	1 15.9	1 17.9	1 20.2	1 22.7	1 25.5	1 28.6	1 32.0	40
4 30	1 13.7	1 15.4	1 17.3	1 19.4	1 21.7	1 24.3	1 27.1	1 30.3	1 33.7	19 30
40	1 14.9	1 16.7	1 18.6	1 20.7	1 23.1	1 25.7	1 28.5	1 31.7	1 35.3	20
50	1 16.0	1 17.8	1 19.7	1 21.9	1 24.3	1 26.9	1 29.7	1 33.0	1 36.6	10
5 0	1 16.9	1 18.7	1 20.7	1 22.9	1 25.3	1 27.9	1 30.8	1 34.1	1 37.7	19 0

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1919.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north]

Lat. / H. A.	32°	34°	36°	38°	40°	42°	44°	46°	48°	Lat. / H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
5 0	1 16.9	1 18.7	1 20.7	1 22.9	1 25.3	1 27.9	1 30.8	1 34.1	1 37.7	19 0
10	1 17.7	1 19.5	1 21.5	1 23.7	1 26.1	1 28.8	1 31.8	1 35.0	1 38.7	18 50
20	1 18.3	1 20.2	1 22.2	1 24.4	1 26.8	1 29.5	1 32.5	1 35.8	1 39.5	40
5 30	1 18.8	1 20.7	1 22.7	1 24.9	1 27.3	1 30.0	1 33.0	1 36.4	1 40.0	18 30
40	1 19.2	1 21.0	1 23.0	1 25.2	1 27.7	1 30.4	1 33.4	1 36.7	1 40.4	20
50	1 19.4	1 21.2	1 23.2	1 25.4	1 27.9	1 30.6	1 33.6	1 36.9	1 40.6	10
6 0	1 19.4	1 21.2	1 23.2	1 25.4	1 27.9	1 30.6	1 33.6	1 36.9	1 40.6	18 0
10	1 19.3	1 21.1	1 23.1	1 25.3	1 27.7	1 30.4	1 33.4	1 36.7	1 40.4	17 50
20	1 19.0	1 20.8	1 22.8	1 25.0	1 27.4	1 30.1	1 33.1	1 36.4	1 40.1	40
6 30	1 18.6	1 20.4	1 22.4	1 24.5	1 27.0	1 29.6	1 32.6	1 35.8	1 39.5	17 30
40	1 18.0	1 19.8	1 21.8	1 23.9	1 26.4	1 28.9	1 31.9	1 35.1	1 38.7	20
50	1 17.3	1 19.1	1 21.0	1 23.1	1 25.5	1 28.1	1 31.0	1 34.2	1 37.7	10
7 0	1 16.4	1 18.2	1 20.1	1 22.2	1 24.5	1 27.1	1 30.0	1 33.1	1 36.6	17 0
10	1 15.4	1 17.2	1 19.0	1 21.1	1 23.4	1 25.9	1 28.8	1 31.9	1 35.3	16 50
20	1 14.3	1 16.0	1 17.8	1 19.9	1 22.1	1 24.6	1 27.4	1 30.4	1 33.9	40
7 30	1 13.0	1 14.7	1 16.5	1 18.5	1 20.7	1 23.1	1 25.9	1 28.8	1 32.2	16 30
40	1 11.6	1 13.2	1 15.0	1 16.9	1 19.1	1 21.5	1 24.2	1 27.1	1 30.4	20
50	1 10.0	1 11.6	1 13.3	1 15.2	1 17.3	1 19.7	1 22.3	1 25.2	1 28.4	10
8 0	1 8.3	1 9.9	1 11.6	1 13.4	1 15.5	1 17.8	1 20.3	1 23.1	1 26.2	16 0
10	1 6.5	1 8.0	1 9.7	1 11.5	1 13.5	1 15.7	1 18.1	1 20.9	1 23.9	15 50
20	1 4.6	1 6.0	1 7.6	1 9.4	1 11.3	1 13.5	1 15.8	1 18.5	1 21.4	40
8 30	1 2.5	1 3.9	1 5.5	1 7.2	1 9.0	1 11.1	1 13.4	1 16.0	1 18.8	15 30
40	1 0.3	1 1.7	1 3.2	1 4.8	1 6.6	1 8.6	1 10.8	1 13.3	1 16.0	20
50	0 58.0	0 59.3	1 0.8	1 2.4	1 4.1	1 6.0	1 8.1	1 10.5	1 13.1	10
9 0	0 55.7	0 56.9	0 58.3	0 59.8	1 1.5	1 3.3	1 5.3	1 7.6	1 10.1	15 0
10	0 53.2	0 54.3	0 55.6	0 57.1	0 58.7	1 0.4	1 2.3	1 4.5	1 6.9	14 50
20	0 50.6	0 51.7	0 52.9	0 54.3	0 55.8	0 57.4	0 59.3	1 1.3	1 3.6	40
9 30	0 47.9	0 48.9	0 50.1	0 51.4	0 52.8	0 54.4	0 56.2	0 58.1	1 0.2	14 30
40	0 45.1	0 46.1	0 47.2	0 48.4	0 49.7	0 51.2	0 52.9	0 54.7	0 56.7	20
50	0 42.2	0 43.2	0 44.2	0 45.3	0 46.6	0 48.0	0 49.5	0 51.2	0 53.1	10
10 0	0 39.3	0 40.1	0 41.1	0 42.2	0 43.3	0 44.6	0 46.0	0 47.6	0 49.4	14 0
10	0 36.3	0 37.0	0 37.9	0 38.9	0 40.0	0 41.2	0 42.5	0 44.0	0 45.6	13 50
20	0 33.2	0 33.9	0 34.7	0 35.6	0 36.6	0 37.7	0 38.9	0 40.2	0 41.7	40
10 30	0 30.0	0 30.7	0 31.4	0 32.2	0 33.1	0 34.1	0 35.2	0 36.4	0 37.7	13 30
40	0 26.8	0 27.4	0 28.1	0 28.8	0 29.6	0 30.5	0 31.4	0 32.5	0 33.7	20
50	0 23.6	0 24.1	0 24.7	0 25.3	0 26.0	0 26.8	0 27.6	0 28.6	0 29.6	10
11 0	0 20.3	0 20.8	0 21.2	0 21.8	0 22.4	0 23.1	0 23.8	0 24.6	0 25.5	13 0
10	0 17.0	0 17.4	0 17.8	0 18.2	0 18.7	0 19.3	0 19.9	0 20.6	0 21.3	12 50
20	0 13.6	0 13.9	0 14.3	0 14.6	0 15.0	0 15.5	0 16.0	0 16.5	0 17.1	40
11 30	0 10.2	0 10.5	0 10.7	0 11.0	0 11.3	0 11.6	0 12.0	0 12.4	0 12.9	12 30
40	0 6.8	0 7.0	0 7.1	0 7.3	0 7.5	0 7.8	0 8.0	0 8.3	0 8.6	20
50	0 3.4	0 3.5	0 3.6	0 3.7	0 3.8	0 3.9	0 4.0	0 4.2	0 4.3	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

Lat. / H. A.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. / H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
10	0 4.5	0 4.7	0 4.9	0 5.1	0 5.4	0 5.7	0 6.1	0 6.3	0 6.5	23 50
20	0 9.0	0 9.4	0 9.8	0 10.3	0 10.8	0 11.4	0 12.1	0 12.5	0 13.0	40
0 30	0 13.4	0 14.0	0 14.7	0 15.4	0 16.2	0 17.1	0 18.2	0 18.8	0 19.4	23 30
40	0 17.8	0 18.6	0 19.5	0 20.5	0 21.5	0 22.8	0 24.2	0 25.0	0 25.8	20
50	0 22.2	0 23.2	0 24.3	0 25.5	0 26.8	0 28.4	0 30.1	0 31.1	0 32.2	10
1 0	0 26.6	0 27.7	0 29.0	0 30.4	0 32.1	0 33.9	0 36.0	0 37.2	0 38.5	23 0

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1919.

[For hour angles 0h to 12h the star is west of north, and for hour angles 12h to 24h it is east of north.]

Lat. / H. A.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. / H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
1 0	0 26.6	0 27.7	0 29.0	0 30.4	0 32.1	0 33.9	0 36.0	0 37.2	0 38.5	23 0
10	0 30.9	0 32.2	0 33.7	0 35.3	0 37.2	0 39.4	0 41.9	0 43.2	0 44.7	22 50
20	0 35.1	0 36.6	0 38.3	0 40.2	0 42.3	0 44.8	0 47.6	0 49.1	0 50.8	40
1 30	0 39.3	0 41.0	0 42.8	0 45.0	0 47.3	0 50.1	0 53.2	0 54.9	0 56.8	22 30
40	0 43.4	0 45.2	0 47.3	0 49.6	0 52.3	0 55.3	0 58.7	1 0.6	1 2.7	20
50	0 47.4	0 49.4	0 51.7	0 54.2	0 57.1	1 0.4	1 4.1	1 6.2	1 8.5	10
2 0	0 51.3	0 53.5	0 55.9	0 58.7	1 1.8	1 5.3	1 9.4	1 11.6	1 14.1	22 0
10	0 55.1	0 57.4	1 0.0	1 3.0	1 6.3	1 10.1	1 14.5	1 16.9	1 19.5	21 50
20	0 58.8	1 1.2	1 4.0	1 7.2	1 10.7	1 14.8	1 19.4	1 22.0	1 24.8	40
2 30	1 2.3	1 5.0	1 7.9	1 11.3	1 15.0	1 19.3	1 24.2	1 27.0	1 29.9	21 30
40	1 5.8	1 8.6	1 11.7	1 15.2	1 19.2	1 23.7	1 28.9	1 31.7	1 34.8	20
50	1 9.1	1 12.0	1 15.3	1 19.0	1 23.1	1 27.9	1 33.3	1 36.3	1 39.6	10
3 0	1 12.3	1 15.3	1 18.7	1 22.6	1 26.9	1 31.9	1 37.6	1 40.7	1 44.1	21 0
10	1 15.3	1 18.5	1 22.0	1 26.0	1 30.5	1 35.7	1 41.6	1 44.9	1 48.4	20 50
20	1 18.2	1 21.5	1 25.1	1 29.3	1 34.0	1 39.3	1 45.4	1 48.8	1 52.5	40
3 30	1 20.9	1 24.3	1 28.1	1 32.4	1 37.2	1 42.7	1 49.1	1 52.6	1 56.4	20 30
40	1 23.5	1 27.0	1 30.9	1 35.3	1 40.3	1 46.0	1 52.5	1 56.1	2 0.0	20
50	1 25.9	1 29.5	1 33.5	1 38.0	1 43.2	1 49.0	1 55.7	1 59.4	2 3.4	10
4 0	1 28.1	1 31.8	1 35.9	1 40.6	1 45.8	1 51.8	1 58.6	2 2.4	2 6.5	20 0
10	1 30.2	1 33.9	1 38.1	1 42.9	1 48.2	1 54.3	2 1.3	2 5.2	2 9.4	19 50
20	1 32.0	1 35.9	1 40.2	1 45.0	1 50.4	1 56.7	2 3.8	2 7.7	2 12.0	40
4 30	1 33.7	1 37.6	1 42.0	1 46.9	1 52.5	1 58.8	2 6.0	2 10.0	2 14.4	19 30
40	1 35.3	1 39.2	1 43.6	1 48.6	1 54.3	2 0.7	2 8.0	2 12.1	2 16.5	20
50	1 36.6	1 40.6	1 45.1	1 50.1	1 55.8	2 2.3	2 9.7	2 13.8	2 18.3	10
5 0	1 37.7	1 41.8	1 46.3	1 51.4	1 57.2	2 3.7	2 11.2	2 15.3	2 19.8	19 0
10	1 38.7	1 42.8	1 47.3	1 52.5	1 58.3	2 4.9	2 12.4	2 16.6	2 21.1	18 50
20	1 39.5	1 43.6	1 48.2	1 53.3	1 59.2	2 5.8	2 13.4	2 17.6	2 22.1	40
5 30	1 40.0	1 44.2	1 48.8	1 54.0	1 59.8	2 6.5	2 14.1	2 18.3	2 22.8	18 30
40	1 40.4	1 44.6	1 49.2	1 54.4	2 0.2	2 6.9	2 14.5	2 18.7	2 23.3	20
50	1 40.6	1 44.8	1 49.4	1 54.6	2 0.4	2 7.1	2 14.7	2 18.9	2 23.5	10
6 0	1 40.6	1 44.7	1 49.3	1 54.5	2 0.4	2 7.0	2 14.6	2 18.8	2 23.4	18 0
10	1 40.4	1 44.5	1 49.1	1 54.3	2 0.1	2 6.7	2 14.3	2 18.5	2 23.0	17 50
20	1 40.1	1 44.1	1 48.7	1 53.9	1 59.6	2 6.2	2 13.7	2 17.9	2 22.3	40
6 30	1 39.5	1 43.5	1 48.1	1 53.2	1 58.9	2 5.4	2 12.9	2 17.0	2 21.4	17 30
40	1 38.7	1 42.7	1 47.2	1 52.3	1 58.0	2 4.4	2 11.8	2 15.9	2 20.3	20
50	1 37.7	1 41.7	1 46.2	1 51.2	1 56.8	2 3.2	2 10.5	2 14.5	2 18.9	10
7 0	1 36.6	1 40.6	1 44.9	1 49.9	1 55.4	2 1.7	2 8.9	2 12.9	2 17.2	17 0
10	1 35.3	1 39.2	1 43.5	1 48.3	1 53.8	2 0.0	2 7.1	2 11.0	2 15.2	16 50
20	1 33.9	1 37.6	1 41.9	1 46.6	1 52.0	1 58.1	2 5.1	2 8.9	2 13.0	40
7 30	1 32.2	1 35.9	1 40.1	1 44.7	1 50.0	1 56.0	2 2.8	2 6.6	2 10.6	16 30
40	1 30.4	1 34.0	1 38.1	1 42.6	1 47.8	1 53.6	2 0.3	2 4.0	2 7.9	20
50	1 28.4	1 31.9	1 35.9	1 40.3	1 45.4	1 51.1	1 57.6	2 1.2	2 5.0	10
8 0	1 26.2	1 29.7	1 33.5	1 37.9	1 42.8	1 48.3	1 54.6	1 58.2	2 1.9	16 0
10	1 23.9	1 27.3	1 31.0	1 35.2	1 40.0	1 45.4	1 51.5	1 54.9	1 58.6	15 50
20	1 21.4	1 24.7	1 28.3	1 32.4	1 37.0	1 42.2	1 48.2	1 51.5	1 55.0	40
8 30	1 18.8	1 21.9	1 25.4	1 29.4	1 33.9	1 38.9	1 44.7	1 47.8	1 51.3	15 30
40	1 16.0	1 19.0	1 22.4	1 26.3	1 30.6	1 35.4	1 40.9	1 44.0	1 47.3	20
50	1 13.1	1 16.0	1 19.3	1 23.0	1 27.1	1 31.7	1 37.0	1 40.0	1 43.2	10
9 0	1 10.1	1 12.9	1 16.0	1 19.5	1 23.4	1 27.9	1 33.0	1 35.8	1 38.8	15 0
10	1 6.9	1 9.6	1 12.5	1 15.9	1 19.6	1 23.9	1 28.7	1 31.4	1 34.3	14 50
20	1 3.6	1 6.1	1 9.0	1 12.2	1 15.7	1 19.8	1 24.3	1 26.9	1 29.6	40
9 30	1 0.2	1 2.6	1 5.3	1 8.3	1 11.6	1 15.5	1 19.8	1 22.2	1 24.8	14 30
40	0 56.7	0 58.9	1 1.5	1 4.3	1 7.4	1 11.0	1 15.1	1 17.4	1 19.8	20
50	0 53.1	0 55.2	0 57.6	1 0.2	1 3.1	1 6.5	1 10.3	1 12.5	1 14.7	10
10 0	0 49.4	0 51.3	0 53.5	0 56.0	0 58.7	1 1.9	1 5.4	1 7.4	1 9.5	14 0

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1919.

[For hour angles 0ʰ to 12ʰ the star is west of north, and for hour angles 12ʰ to 24ʰ it is east of north.]

Lat. H. A.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. H. A.
h m	° '	° '	° '	° '	° '	° '	° '	° '	° '	h m
10 0	0 49.4	0 51.3	0 53.5	0 56.0	0 58.7	1 1.9	1 5.4	1 7.4	1 9.5	14 0
10	0 45.6	0 47.4	0 49.4	0 51.6	0 54.2	0 57.1	1 0.4	1 2.2	1 4.1	13 50
20	0 41.7	0 43.3	0 45.2	0 47.2	0 49.6	0 52.2	0 55.2	0 56.9	0 58.7	40
10 30	0 37.7	0 39.2	0 40.9	0 42.8	0 44.9	0 47.3	0 50.0	0 51.5	0 53.1	13 30
40	0 33.7	0 35.1	0 36.5	0 38.2	0 40.1	0 42.2	0 44.6	0 46.0	0 47.4	20
50	0 29.6	0 30.8	0 32.1	0 33.6	0 35.2	0 37.1	0 39.2	0 40.4	0 41.7	10
11 0	0 25.5	0 26.5	0 27.6	0 28.9	0 30.3	0 31.9	0 33.8	0 34.8	0 35.9	13 0
10	0 21.3	0 22.2	0 23.1	0 24.2	0 25.3	0 26.7	0 28.2	0 29.1	0 30.0	12 50
20	0 17.1	0 17.8	0 18.5	0 19.4	0 20.3	0 21.4	0 22.6	0 23.3	0 24.0	40
11 30	0 12.9	0 13.4	0 13.9	0 14.6	0 15.3	0 16.1	0 17.0	0 17.5	0 18.1	12 30
40	0 8.6	0 8.9	0 9.3	0 9.7	0 10.2	0 10.7	0 11.4	0 11.7	0 12.1	20
50	0 4.3	0 4.5	0 4.7	0 4.9	0 5.1	0 5.4	0 5.7	0 5.9	0 6.0	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

Lat. H. A.	62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat. H. A.
h m	° '	° '	° '	° '	° '	° '	° '	° '	° '	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
10	0 6.5	0 6.7	0 7.0	0 7.3	0 7.6	0 7.9	0 8.2	0 8.6	0 9.1	23 50
20	0 13.0	0 13.4	0 13.9	0 14.5	0 15.1	0 15.7	0 16.5	0 17.2	0 18.1	40
0 30	0 19.4	0 20.1	0 20.9	0 21.7	0 22.6	0 23.6	0 24.6	0 25.8	0 27.1	23 30
40	0 25.8	0 26.8	0 27.8	0 28.8	0 30.0	0 31.4	0 32.8	0 34.3	0 36.1	20
50	0 32.2	0 33.4	0 34.6	0 35.9	0 37.4	0 39.1	0 40.8	0 42.8	0 45.0	10
1 0	0 38.5	0 39.9	0 41.4	0 43.0	0 44.8	0 46.7	0 48.8	0 51.2	0 53.7	23 0
10	0 44.7	0 46.3	0 48.0	0 49.9	0 52.0	0 54.2	0 56.7	0 59.4	1 2.4	22 50
20	0 50.8	0 52.6	0 54.6	0 56.7	0 59.0	1 1.6	1 4.4	1 7.5	1 10.9	40
1 30	0 56.8	0 58.8	1 1.1	1 3.4	1 6.0	1 8.9	1 12.0	1 15.5	1 19.3	22 30
40	1 2.7	1 4.9	1 7.4	1 10.0	1 12.9	1 16.0	1 19.4	1 23.2	1 27.5	20
50	1 8.5	1 10.9	1 13.6	1 16.4	1 19.5	1 23.0	1 26.7	1 30.8	1 35.4	10
2 0	1 14.1	1 16.7	1 19.6	1 22.7	1 26.0	1 29.7	1 33.8	1 38.3	1 43.2	22 0
10	1 19.5	1 22.3	1 25.4	1 28.8	1 32.4	1 36.3	1 40.7	1 45.5	1 50.8	21 50
20	1 24.8	1 27.8	1 31.1	1 34.6	1 38.5	1 42.7	1 47.3	1 52.4	1 58.1	40
2 30	1 29.9	1 33.1	1 36.6	1 40.3	1 44.4	1 48.9	1 53.8	1 59.1	2 5.1	21 30
40	1 34.8	1 38.2	1 41.9	1 45.8	1 50.1	1 54.8	2 0.0	2 5.6	2 11.9	20
50	1 39.6	1 43.1	1 46.9	1 51.1	1 55.6	2 0.5	2 5.9	2 11.9	2 18.4	10
3 0	1 44.1	1 47.8	1 51.8	1 56.1	2 0.8	2 5.9	2 11.6	2 17.8	2 24.6	21 0
10	1 48.4	1 52.3	1 56.4	2 0.9	2 5.8	2 11.1	2 17.0	2 23.4	2 30.5	20 50
20	1 52.5	1 56.5	2 0.8	2 5.4	2 10.5	2 16.0	2 22.1	2 28.7	2 36.1	40
3 30	1 56.4	2 0.5	2 4.9	2 9.7	2 14.9	2 20.6	2 26.9	2 33.8	2 41.4	20 30
40	2 0.0	2 4.2	2 8.8	2 13.7	2 19.0	2 24.9	2 31.4	2 38.5	2 46.3	20
50	2 3.4	2 7.7	2 12.4	2 17.4	2 22.9	2 29.0	2 35.6	2 42.8	2 50.9	10
4 0	2 6.5	2 10.9	2 15.7	2 20.9	2 26.5	2 32.7	2 39.4	2 46.9	2 55.1	20 0
10	2 9.4	2 13.9	2 18.8	2 24.1	2 29.8	2 36.1	2 43.0	2 50.6	2 58.9	19 50
20	2 12.0	2 16.6	2 21.6	2 26.9	2 32.8	2 39.2	2 46.2	2 53.9	3 2.4	40
4 30	2 14.4	2 19.0	2 24.1	2 29.5	2 35.5	2 42.0	2 49.1	2 56.9	3 5.6	19 30
40	2 16.5	2 21.2	2 26.3	2 31.8	2 37.8	2 44.4	2 51.6	2 59.6	3 8.3	20
50	2 18.3	2 23.0	2 28.2	2 33.8	2 39.9	2 46.6	2 53.8	3 1.8	3 10.7	10
5 0	2 19.8	2 24.6	2 29.8	2 35.5	2 41.7	2 48.4	2 55.7	3 3.8	3 12.7	19 0
10	2 21.1	2 25.9	2 31.2	2 36.9	2 43.1	2 49.8	2 57.2	3 5.3	3 14.3	18 50
20	2 22.1	2 27.0	2 32.3	2 38.0	2 44.2	2 51.0	2 58.4	3 6.5	3 15.5	40
5 30	2 22.8	2 27.7	2 33.0	2 38.8	2 45.0	2 51.8	2 59.2	3 7.4	3 16.4	18 30
40	2 23.3	2 28.2	2 33.5	2 39.2	2 45.5	2 52.2	2 59.7	3 7.9	3 16.9	20
50	2 23.5	2 28.4	2 33.6	2 39.4	2 45.6	2 52.4	2 59.8	3 8.0	3 17.0	10
6 0	2 23.4	2 28.2	2 33.5	2 39.2	2 45.4	2 52.2	2 59.6	3 7.7	3 16.7	18 0

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1919.

[For hour angles 0ʰ to 12ʰ the star is west of north, and for hour angles 12ʰ to 24ʰ it is east of north.]

Lat. / H. A.	62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat. / H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
6 0	2 23.4	2 28.2	2 33.5	2 39.2	2 45.4	2 52.2	2 59.6	3 7.7	3 16.7	18 0
10	2 23.0	2 27.8	2 33.1	2 38.8	2 45.0	2 51.7	2 59.1	3 7.1	3 16.0	17 50
20	2 22.3	2 27.2	2 32.4	2 38.0	2 44.2	2 50.9	2 58.2	3 6.2	3 15.0	40
6 30	2 21.4	2 26.2	2 31.4	2 37.0	2 43.1	2 49.7	2 56.9	3 4.9	3 13.6	17 30
40	2 20.3	2 25.0	2 30.1	2 35.7	2 41.7	2 48.2	2 55.4	3 3.3	3 11.9	20
50	2 18.9	2 23.5	2 28.6	2 34.1	2 40.0	2 46.5	2 53.5	3 1.3	3 9.8	10
7 0	2 17.2	2 21.8	2 26.7	2 32.2	2 38.0	2 44.4	2 51.3	2 59.0	3 7.4	17 0
10	2 15.2	2 19.8	2 24.7	2 30.0	2 35.7	2 42.0	2 48.8	2 56.3	3 4.6	16 50
20	2 13.0	2 17.5	2 22.3	2 27.5	2 33.2	2 39.3	2 46.0	2 53.4	3 1.5	40
7 30	2 10.6	2 15.0	2 19.7	2 24.8	2 30.3	2 36.3	2 42.9	2 50.1	2 58.1	16 30
40	2 7.9	2 12.2	2 16.8	2 21.8	2 27.2	2 33.1	2 39.5	2 46.6	2 54,3	20
50	2 5.0	2 9.2	2 13.7	2 18.6	2 23.8	2 29.6	2 35.9	2 42.7	2 50.3	10
8 0	2 1.9	2 6.0	2 10.4	2 15.1	2 20.2	2 25.8	2 31.9	2 38.6	2 45.9	16 0
10	1 58.6	2 2.5	2 6.8	2 11.4	2 16.3	2 21.8	2 27.7	2 34.2	2 41.3	15 50
20	1 55.0	1 58.8	2 3.0	2 7.4	2 12.2	2 17.5	2 23.2	2 29.4	2 36.4	40
8 30	1 51.3	1 55.0	1 58.9	2 3.2	2 7.9	2 12.9	2 18.5	2 24.5	2 31.2	15 30
40	1 47.3	1 50.9	1 54.7	1 58.8	2 3.3	2 8.2	2 13.5	2 19.3	2 25.7	20
50	1 43.2	1 46.6	1 50.2	1 54.2	1 58.5	2 3.2	2 8.3	2 13.9	2 20.0	10
9 0	1 38.8	1 42.1	1 45.6	1 49.4	1 53.5	1 58.0	2 2.9	2 8.2	2 14.1	15 0
10	1 34.3	1 37.4	1 40.8	1 44.4	1 48.3	1 52.6	1 57.2	2 2.3	2 7.9	14 50
20	1 29.6	1 32.6	1 35.8	1 39.2	1 42.9	1 47.0	1 51.4	1 56.2	2 1.5	40
9 30	1 24.8	1 27.6	1 30.6	1 33.9	1 37.4	1 41.2	1 45.4	1 49.9	1 54.9	14 30
40	1 19.8	1 22.5	1 25.3	1 28.4	1 31.7	1 35.2	1 39.2	1 43.4	1 48.1	20
50	1 14.7	1 17.2	1 19.8	1 22.7	1 25.8	1 29.1	1 32.8	1 36.8	1 41.2	10
10 0	1 9.5	1 11.8	1 14.2	1 16.9	1 19.7	1 22.8	1 26.2	1 30.0	1 34.1	14 0
10	1 4.1	1 6.2	1 8.5	1 10.9	1 13.6	1 16.4	1 19.6	1 23.0	1 26.8	13 50
20	0 58.7	1 0.6	1 2.6	1 4.9	1 7.3	1 9.9	1 12.8	1 15.9	1 19.4	40
10 30	0 53.1	0 54.8	0 56.7	0 58.7	1 0.9	1 3.3	1 5.8	1 8.7	1 11.8	13 30
40	0 47.4	0 49.0	0 50.6	0 52.4	0 54.4	0 56.5	0 58.8	1 1.3	1 4.1	20
50	0 41.7	0 43.0	0 44.5	0 46.1	0 47.8	0 49.6	0 51.7	0 53.9	0 56.3	10
11 0	0 35.9	0 37.0	0 38.3	0 39.6	0 41.1	0 42.7	0 44.4	0 46.3	0 48.4	13 0
10	0 30.0	0 30.9	0 32.0	0 33.1	0 34.4	0 35.7	0 37.1	0 38.7	0 40.5	12 50
20	0 24.0	0 24.8	0 25.7	0 26.6	0 27.6	0 28.6	0 29.8	0 31.1	0 32.5	40
11 30	0 18.1	0 18.7	0 19.3	0 20.0	0 20.7	0 21.5	0 22.4	0 23.4	0 24.4	12 30
40	0 12.1	0 12.5	0 12.9	0 13.3	0 13.8	0 14.4	0 15.0	0 15.6	0 16.3	20
50	0 6.0	0 6.2	0 6.4	0 6.7	0 6.9	0 7.2	0 7.5	0 7.8	0 8.2	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

TABLE IVa.

Table IV has been computed for a declination of 88° 52′ 40″. For other declinations of Polaris the corrections given below should be applied to the Azimuth taken from Table IV.

Azimuth. / Decl.	0′	20′	40′	60′	80′	100′	120′	140′	160′	180′	200′	Azimuth. / Decl.
° ′ ″	′	′	′	′	′	′	′	′	′	′	′	° ′ ″
88 52 15	0.0	+0.1	+0.2	+0.4	+0.5	+0.6	+0.7	+0.9	+1.0	+1.1	+1.2	88 52 15
88 52 20	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	88 52 20
88 52 25	0.0	+0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7	88 52 25
88 52 30	0.0	0.0	+0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	88 52 30
88 52 35	0.0	0.0	0.0	+0.1	+0.1	+0.1	+0.1	+0.2	+0.2	+0.2	+0.2	88 52 35
88 52 40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	88 52 40
88 52 45	0.0	0.0	0.0	−0.1	−0.1	−0.1	−0.1	−0.2	−0.2	−0.2	−0.2	88 52 45
88 52 50	0.0	0.0	−0.1	−0.1	−0.2	−0.2	−0.3	−0.3	−0.4	−0.4	−0.5	88 52 50
88 52 55	0.0	−0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7	88 52 55
88 53 0	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	88 53 0
88 53 5	0.0	−0.1	−0.2	−0.4	−0.5	−0.6	−0.7	−0.9	−1.0	−1.1	−1.2	88 53 5

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1919.

Decl. / Lat.	88° 52′ 10″	88° 52′ 20″	88° 52′ 30″	88° 52′ 40″	88° 52′ 50″	88° 53′ 0″	Variation for—	
							1′ of Lat.	1″ of δ
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
10 0	1 8 52.8	1 8 42.6	1 8 32.5	1 8 22.3	1 8 12.2	1 8 2.1	+0.21	−1.01
10 20	1 8 57.1	1 8 46.9	1 8 36.8	1 8 26.6	1 8 16.4	1 8 6.3	0.22	1.02
10 40	1 9 1.6	1 8 51.4	1 8 41.2	1 8 31.0	1 8 20.9	1 8 10.7	0.23	1.02
11 0	1 9 6.2	1 8 56.0	1 8 45.8	1 8 35.6	1 8 25.4	1 8 15.3	0.23	1.02
11 20	1 9 11.0	1 9 0.8	1 8 50.6	1 8 40.4	1 8 30.2	1 8 20.0	0.24	1.02
11 40	1 9 15.9	1 9 5.7	1 8 55.5	1 8 45.2	1 8 35.0	1 8 24.8	+0.25	−1.02
12 0	1 9 20.9	1 9 10.7	1 9 0.5	1 8 50.3	1 8 40.0	1 8 29.8	0.26	1.02
12 20	1 9 26.2	1 9 15.9	1 9 5.7	1 8 55.5	1 8 45.2	1 8 35.0	0.26	1.02
12 40	1 9 31.5	1 9 21.3	1 9 11.0	1 9 0.8	1 8 50.5	1 8 40.3	0.27	1.02
13 0	1 9 37.1	1 9 26.8	1 9 16.5	1 9 6.3	1 8 56.0	1 8 45.8	0.28	1.03
13 20	1 9 42.8	1 9 32.5	1 9 22.2	1 9 11.9	1 9 1.6	1 8 51.4	+0.29	−1.03
13 40	1 9 48.6	1 9 38.3	1 9 28.0	1 9 17.7	1 9 7.4	1 8 57.2	0.30	1.03
14 0	1 9 54.6	1 9 44.3	1 9 34.0	1 9 23.7	1 9 13.4	1 9 3.1	0.30	1.03
14 20	1 10 0.8	1 9 50.5	1 9 40.1	1 9 29.8	1 9 19.5	1 9 9.2	0.31	1.03
14 40	1 10 7.1	1 9 56.8	1 9 46.4	1 9 36.1	1 9 25.8	1 9 15.4	0.32	1.03
15 0	1 10 13.6	1 10 3.2	1 9 52.9	1 9 42.5	1 9 32.2	1 9 21.8	+0.33	−1.04
15 20	1 10 20.2	1 10 9.9	1 9 59.5	1 9 49.1	1 9 38.8	1 9 28.4	0.34	1.04
15 40	1 10 27.1	1 10 16.7	1 10 6.3	1 9 55.9	1 9 45.5	1 9 35.1	0.34	1.04
16 0	1 10 34.0	1 10 23.6	1 10 13.2	1 10 2.8	1 9 52.4	1 9 42.0	0.35	1.04
16 20	1 10 41.2	1 10 30.8	1 10 20.3	1 10 9.9	1 9 59.5	1 9 49.1	0.36	1.04
16 40	1 10 48.5	1 10 38.1	1 10 27.6	1 10 17.2	1 10 6.8	1 9 56.3	+0.37	−1.04
17 0	1 10 56.0	1 10 45.5	1 10 35.1	1 10 24.6	1 10 14.2	1 10 3.7	0.38	1.05
17 20	1 11 3.6	1 10 53.2	1 10 42.7	1 10 32.2	1 10 21.7	1 10 11.3	0.39	1.05
17 40	1 11 11.5	1 11 1.0	1 10 50.5	1 10 40.0	1 10 29.5	1 10 19.0	0.39	1.05
18 0	1 11 19.5	1 11 9.0	1 10 58.5	1 10 47.9	1 10 37.4	1 10 26.9	0.40	1.05
18 20	1 11 27.7	1 11 17.1	1 11 6.6	1 10 56.1	1 10 45.5	1 10 35.0	+0.41	−1.05
18 40	1 11 36.0	1 11 25.5	1 11 14.9	1 11 4.4	1 10 53.8	1 10 43.2	0.42	1.06
19 0	1 11 44.5	1 11 34.0	1 11 23.4	1 11 12.8	1 11 2.2	1 10 51.7	0.43	1.06
19 20	1 11 53.3	1 11 42.7	1 11 32.1	1 11 21.5	1 11 10.9	1 11 0.3	0.44	1.06
19 40	1 12 2.2	1 11 51.5	1 11 40.9	1 11 30.3	1 11 19.7	1 11 9.1	0.45	1.06
20 0	1 12 11.2	1 12 0.6	1 11 50.0	1 11 39.3	1 11 28.7	1 11 18.0	+0.46	−1.06
20 20	1 12 20.5	1 12 9.8	1 11 59.2	1 11 48.5	1 11 37.8	1 11 27.2	0.47	1.07
20 40	1 12 30.0	1 12 19.3	1 12 8.6	1 11 57.9	1 11 47.2	1 11 36.5	0.48	1.07
21 0	1 12 39.6	1 12 28.9	1 12 18.2	1 12 7.5	1 11 56.8	1 11 46.0	0.48	1.07
21 20	1 12 49.4	1 12 38.7	1 12 28.0	1 12 17.2	1 12 6.5	1 11 55.8	0.49	1.07
21 40	1 12 59.5	1 12 48.7	1 12 37.9	1 12 27.2	1 12 16.4	1 12 5.7	+0.50	−1.08
22 0	1 13 9.7	1 12 58.9	1 12 48.1	1 12 37.3	1 12 26.5	1 12 15.8	0.51	1.08
22 20	1 13 20.1	1 13 9.3	1 12 58.5	1 12 47.7	1 12 36.9	1 12 26.0	0.52	1.08
22 40	1 13 30.7	1 13 19.9	1 13 9.0	1 12 58.2	1 12 47.4	1 12 36.5	0.53	1.08
23 0	1 13 41.5	1 13 30.7	1 13 19.8	1 13 8.9	1 12 58.1	1 12 47.2	0.54	1.09
23 20	1 13 52.6	1 13 41.7	1 13 30.8	1 13 19.9	1 13 9.0	1 12 58.1	+0.55	−1.09
23 40	1 14 3.8	1 13 52.9	1 13 42.0	1 13 31.0	1 13 20.1	1 13 9.2	0.56	1.09
24 0	1 14 15.2	1 14 4.3	1 13 53.3	1 13 42.4	1 13 31.4	1 13 20.5	0.57	1.09
24 20	1 14 26.9	1 14 15.9	1 14 4.9	1 13 53.9	1 13 43.0	1 13 32.0	0.58	1.10
24 40	1 14 38.7	1 14 27.7	1 14 16.7	1 14 5.7	1 13 54.7	1 13 43.7	0.60	1.10
25 0	1 14 50.8	1 14 39.8	1 14 28.7	1 14 17.7	1 14 6.7	1 13 55.6	+0.61	−1.10
25 20	1 15 3.1	1 14 52.0	1 14 41.0	1 14 29.9	1 14 18.8	1 14 7.8	0.62	1.11
25 40	1 15 15.6	1 15 4.5	1 14 53.4	1 14 42.3	1 14 31.2	1 14 20.1	0.63	1.11
26 0	1 15 28.4	1 15 17.2	1 15 6.1	1 14 55.0	1 14 43.8	1 14 32.7	0.64	1.11
26 29	1 15 41.3	1 15 30.2	1 15 19.0	1 15 7.8	1 14 56.7	1 14 45.5	0.65	1.12
26 40	1 15 54.5	1 15 43.3	1 15 32.1	1 15 20.9	1 15 9.8	1 14 58.6	+0.66	−1.12
27 0	1 16 7.9	1 15 56.7	1 15 45.5	1 15 34.3	1 15 23.1	1 15 11.8	0.67	1.12
27 20	1 16 21.6	1 16 10.3	1 15 59.1	1 15 47.8	1 15 36.6	1 15 25.3	0.68	1.13
27 40	1 16 35.5	1 16 24.2	1 16 12.9	1 16 1.6	1 15 50.3	1 15 39.0	0.70	1.13
28 0	1 16 49.6	1 16 38.3	1 16 27.0	1 16 15.7	1 16 4.3	1 15 53.0	0.71	1.13
28 20	1 17 4.0	1 16 52.7	1 16 41.3	1 16 29.9	1 16 18.6	1 16 7.2	+0.72	−1.14
28 40	1 17 18.7	1 17 7.3	1 16 55.9	1 16 44.5	1 16 33.1	1 16 21.7	0.73	1.14
29 0	1 17 33.5	1 17 22.1	1 17 10.7	1 16 59.2	1 16 47.8	1 16 36.4	0.74	1.14
29 20	1 17 48.7	1 17 37.2	1 17 25.7	1 17 14.3	1 17 2.8	1 16 51.3	0.76	1.15
29 40	1 18 4.1	1 17 52.6	1 17 41.0	1 17 29.5	1 17 18.0	1 17 6.5	0.77	1.15
30 0	1 18 19.7	1 18 8.2	1 17 56.6	1 17 45.1	1 17 33.5	1 17 22.0	+0.79	−1.15

AZIMUTH OF POLARIS AT ELONGATION, 1919.

Decl. / Lat.	88° 52′ 10″	88° 52′ 20″	88° 52′ 30″	88° 52′ 40″	88° 52′ 50″	88° 53′ 0″	Variation for— 1′ of Lat.	Variation for— 1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
30 0	1 18 19.7	1 18 8.2	1 17 56.6	1 17 45.1	1 17 33.5	1 17 22.0	+0.79	−1.15
30 10	1 18 27.7	1 18 16.1	1 18 4.5	1 17 53.0	1 17 41.4	1 17 29.8	0.80	1.16
30 20	1 18 35.7	1 18 24.1	1 18 12.5	1 18 0.9	1 17 49.3	1 17 37.7	0.80	1.16
30 30	1 18 43.7	1 18 32.1	1 18 20.5	1 18 8.9	1 17 57.3	1 17 45.7	0.81	1.16
30 40	1 18 51.8	1 18 40.2	1 18 28.6	1 18 17.0	1 18 5.3	1 17 53.7	0.81	1.16
30 50	1 19 0.0	1 18 48.4	1 18 36.8	1 18 25.1	1 18 13.5	1 18 1.8	+0.82	−1.16
31 0	1 19 8.3	1 18 56.6	1 18 45.0	1 18 33.3	1 18 21.6	1 18 10.0	0.83	1.17
31 10	1 19 16.6	1 19 4.9	1 18 53.3	1 18 41.6	1 18 29.9	1 18 18.2	0.83	1.17
31 20	1 19 25.0	1 19 13.3	1 19 1.6	1 18 49.9	1 18 38.2	1 18 26.5	0.84	1.17
31 30	1 19 33.5	1 19 21.8	1 19 10.1	1 18 58.3	1 18 46.6	1 18 34.9	0.85	1.17
31 40	1 19 42.1	1 19 30.3	1 19 18.6	1 19 6.8	1 18 55.1	1 18 43.3	+0.86	−1.18
31 50	1 19 50.7	1 19 38.9	1 19 27.2	1 19 15.4	1 19 3.6	1 18 51.8	0.86	1.18
32 0	1 19 59.4	1 19 47.6	1 19 35.8	1 19 24.0	1 19 12.2	1 19 0.4	0.87	1.18
32 10	1 20 8.1	1 19 56.3	1 19 44.5	1 19 32.7	1 19 20.9	1 19 9.1	0.88	1.18
32 20	1 20 17.0	1 20 5.1	1 19 53.3	1 19 41.5	1 19 29.6	1 19 17.8	0.88	1.18
32 30	1 20 25.9	1 20 14.0	1 20 2.2	1 19 50.3	1 19 38.4	1 19 26.6	+0.89	−1.19
32 40	1 20 34.9	1 20 23.0	1 20 11.1	1 19 59.2	1 19 47.3	1 19 35.5	0.90	1.19
32 50	1 20 43.9	1 20 32.0	1 20 20.1	1 20 8.2	1 19 56.3	1 19 44.4	0.91	1.19
33 0	1 20 53.1	1 20 41.1	1 20 29.2	1 20 17.3	1 20 5.4	1 19 53.4	0.91	1.19
33 10	1 21 2.3	1 20 50.3	1 20 38.4	1 20 26.4	1 20 14.5	1 20 2.5	0.92	1.20
33 20	1 21 11.5	1 20 59.6	1 20 47.6	1 20 35.6	1 20 23.7	1 20 11.7	+0.93	−1.20
33 30	1 21 20.9	1 21 8.9	1 20 56.9	1 20 44.9	1 20 32.9	1 20 20.9	0.94	1.20
33 40	1 21 30.3	1 21 18.3	1 21 6.3	1 20 54.3	1 20 42.3	1 20 30.3	0.94	1.20
33 50	1 21 39.9	1 21 27.8	1 21 15.8	1 21 3.7	1 20 51.7	1 20 39.7	0.95	1.20
34 0	1 21 49.5	1 21 37.4	1 21 25.3	1 21 13.3	1 21 1.2	1 20 49.1	0.96	1.21
34 10	1 21 59.1	1 21 47.0	1 21 34.9	1 21 22.9	1 21 10.8	1 20 58.7	+0.96	−1.21
34 20	1 22 8.9	1 21 56.8	1 21 44.6	1 21 32.5	1 21 20.4	1 21 8.3	0.97	1.21
34 30	1 22 18.7	1 22 6.6	1 21 54.4	1 21 42.3	1 21 30.2	1 21 18.0	0.98	1.21
34 40	1 22 28.6	1 22 16.5	1 22 4.3	1 21 52.2	1 21 40.0	1 21 27.8	0.99	1.22
34 50	1 22 38.6	1 22 26.5	1 22 14.3	1 22 2.1	1 21 49.9	1 21 37.7	1.00	1.22
35 0	1 22 48.7	1 22 36.5	1 22 24.3	1 22 12.1	1 21 59.9	1 21 47.7	+1.01	−1.22
35 10	1 22 58.9	1 22 46.6	1 22 34.4	1 22 22.2	1 22 9.9	1 21 57.7	1.01	1.22
35 20	1 23 9.1	1 22 56.9	1 22 44.6	1 22 32.3	1 22 20.1	1 22 7.8	1.02	1.23
35 30	1 23 19.5	1 23 7.2	1 22 54.9	1 22 42.6	1 22 30.3	1 22 18.0	1.03	1.23
35 40	1 23 29.9	1 23 17.6	1 23 5.3	1 22 52.9	1 22 40.6	1 22 28.3	1.04	1.23
35 50	1 23 40.4	1 23 28.0	1 23 15.7	1 23 3.4	1 22 51.0	1 22 38.7	+1.05	−1.23
36 0	1 23 51.0	1 23 38.6	1 23 26.2	1 23 13.9	1 23 1.5	1 22 49.2	1.06	1.24
36 10	1 24 1.6	1 23 49.3	1 23 36.9	1 23 24.5	1 23 12.1	1 22 59.7	1.07	1.24
36 20	1 24 12.4	1 24 0.0	1 23 47.6	1 23 35.2	1 23 22.8	1 23 10.3	1.07	1.24
36 30	1 24 23.3	1 24 10.8	1 23 58.4	1 23 45.9	1 23 33.5	1 23 21.1	1.08	1.24
36 40	1 24 34.2	1 24 21.7	1 24 9.3	1 23 56.8	1 23 44.3	1 23 31.9	+1.09	−1.25
36 50	1 24 45.2	1 24 32.7	1 24 20.2	1 24 7.8	1 23 55.3	1 23 42.8	1.10	1.25
37 0	1 24 56.4	1 24 43.9	1 24 31.3	1 24 18.8	1 24 6.3	1 23 53.8	1.11	1.25
37 10	1 25 7.6	1 24 55.1	1 24 42.5	1 24 29.9	1 24 17.4	1 24 4.8	1.12	1.26
37 20	1 25 18.9	1 25 6.3	1 24 53.8	1 24 41.2	1 24 28.6	1 24 16.0	1.13	1.26
37 30	1 25 30.3	1 25 17.7	1 25 5.1	1 24 52.5	1 24 39.9	1 24 27.3	+1.14	−1.26
37 40	1 25 41.8	1 25 29.2	1 25 16.5	1 25 3.9	1 24 51.3	1 24 38.6	1.15	1.26
37 50	1 25 53.4	1 25 40.8	1 25 28.1	1 25 15.4	1 25 2.8	1 24 50.1	1.16	1.27
38 0	1 26 5.1	1 25 52.4	1 25 39.7	1 25 27.0	1 25 14.3	1 25 1.6	1.17	1.27
38 10	1 26 16.9	1 26 4.2	1 25 51.5	1 25 38.7	1 25 26.0	1 25 13.3	1.18	1.27
38 20	1 26 28.8	1 26 16.0	1 26 3.3	1 25 50.5	1 25 37.8	1 25 25.0	+1.19	−1.28
38 30	1 26 40.8	1 26 28.0	1 26 15.2	1 26 2.4	1 25 49.7	1 25 36.9	1.20	1.28
38 40	1 26 52.9	1 26 40.0	1 26 27.2	1 26 14.4	1 26 1.6	1 25 48.8	1.21	1.28
38 50	1 27 5.0	1 26 52.2	1 26 39.4	1 26 26.5	1 26 13.7	1 26 0.9	1.22	1.28
39 0	1 27 17.3	1 27 4.5	1 26 51.6	1 26 38.7	1 26 25.9	1 26 13.0	1.23	1.29
39 10	1 27 29.7	1 27 16.8	1 27 3.9	1 26 51.0	1 26 38.1	1 26 25.2	+1.24	−1.29
39 20	1 27 42.2	1 27 29.3	1 27 16.4	1 27 3.4	1 26 50.5	1 26 37.6	1.25	1.29
39 30	1 27 54.8	1 27 41.9	1 27 28.9	1 27 15.9	1 27 3.0	1 26 50.0	1.26	1.30
39 40	1 28 7.5	1 27 54.5	1 27 41.5	1 27 28.5	1 27 15.5	1 27 2.6	1.27	1.30
39 50	1 28 20.3	1 28 7.3	1 27 54.3	1 27 41.3	1 27 28.2	1 27 15.2	1.28	1.30
40 0	1 28 33.2	1 28 20.2	1 28 7.1	1 27 54.1	1 27 41.0	1 27 28.0	+1.29	−1.31

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1919.

Decl. / Lat.	88° 52′ 10″	88° 52′ 20″	88° 52′ 30″	88° 52′ 40″	88° 52′ 50″	88° 53′ 0″	Variation for—	
							1′ of Lat.	1″ of δ
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
40 0	1 28 33.2	1 28 20.2	1 28 7.1	1 27 54.1	1 27 41.0	1 27 28.0	+1.29	−1.31
40 10	1 28 46.3	1 28 33.2	1 28 20.1	1 28 7.0	1 27 53.9	1 27 40.8	1.30	1.31
40 20	1 28 59.4	1 28 46.3	1 28 33.2	1 28 20.0	1 28 6.9	1 27 53.8	1.31	1.31
40 30	1 29 12.7	1 28 59.5	1 28 46.4	1 28 33.2	1 28 20.0	1 28 6.9	1.32	1.32
40 40	1 29 26.0	1 29 12.8	1 28 59.6	1 28 46.5	1 28 33.3	1 28 20.1	1.33	1.32
40 50	1 29 39.5	1 29 26.3	1 29 13.0	1 28 59.8	1 28 46.6	1 28 33.4	+1.35	−1.32
41 0	1 29 53.1	1 29 39.8	1 29 26.6	1 29 13.3	1 29 0.1	1 28 46.8	1.36	1.33
41 10	1 30 6.8	1 29 53.5	1 29 40.2	1 29 26.9	1 29 13.6	1 29 0.3	1.37	1.33
41 20	1 30 20.6	1 30 7.3	1 29 53.9	1 29 40.6	1 29 27.3	1 29 14.0	1.38	1.33
41 30	1 30 34.5	1 30 21.2	1 30 7.8	1 29 54.4	1 29 41.1	1 29 27.7	1.39	1.34
41 40	1 30 48.6	1 30 35.2	1 30 21.8	1 30 8.4	1 29 55.0	1 29 41.6	+1.40	−1.34
41 50	1 31 2.7	1 30 49.3	1 30 35.9	1 30 22.5	1 30 9.0	1 29 55.6	1.41	1.34
42 0	1 31 17.0	1 31 3.6	1 30 50.1	1 30 36.6	1 30 23.2	1 30 9.7	1.42	1.35
42 10	1 31 31.4	1 31 17.9	1 31 4.4	1 30 50.9	1 30 37.4	1 30 24.0	1.44	1.35
42 20	1 31 46.0	1 31 32.4	1 31 18.9	1 31 5.4	1 30 51.8	1 30 38.3	1.45	1.35
42 30	1 32 0.6	1 31 47.0	1 31 33.5	1 31 19.9	1 31 6.3	1 30 52.8	+1.46	−1.36
42 40	1 32 15.4	1 32 1.8	1 31 48.2	1 31 34.6	1 31 21.0	1 31 7.4	1.48	1.36
42 50	1 32 30.3	1 32 16.7	1 32 3.0	1 31 49.4	1 31 35.7	1 31 22.1	1.49	1.36
43 0	1 32 45.3	1 32 31.7	1 32 18.0	1 32 4.3	1 31 50.6	1 31 37.0	1.50	1.37
43 10	1 33 0.5	1 32 46.8	1 32 33.1	1 32 19.4	1 32 5.6	1 31 51.9	1.51	1.37
43 20	1 33 15.8	1 33 2.0	1 32 48.3	1 32 34.5	1 32 20.8	1 32 7.0	+1.53	−1.38
43 30	1 33 31.2	1 33 17.4	1 33 3.6	1 32 49.9	1 32 36.1	1 32 22.3	1.54	1.38
43 40	1 33 46.8	1 33 33.0	1 33 19.1	1 33 5.3	1 32 51.5	1 32 37.7	1.55	1.38
43 50	1 34 2.5	1 33 48.6	1 33 34.7	1 33 20.9	1 33 7.0	1 32 53.2	1.57	1.39
44 0	1 34 18.3	1 34 4.4	1 33 50.5	1 33 36.6	1 33 22.7	1 33 8.8	1.58	1.39
44 10	1 34 34.3	1 34 20.3	1 34 6.4	1 33 52.4	1 33 38.5	1 33 24.6	+1.59	−1.39
44 20	1 34 50.4	1 34 36.4	1 34 22.4	1 34 8.4	1 33 54.4	1 33 40.5	1.61	1.40
44 30	1 35 6.6	1 34 52.6	1 34 38.6	1 34 24.6	1 34 10.5	1 33 56.5	1.62	1.40
44 40	1 35 23.0	1 35 9.0	1 34 54.9	1 34 40.8	1 34 26.8	1 34 12.7	1.63	1.41
44 50	1 35 39.5	1 35 25.4	1 35 11.3	1 34 57.2	1 34 43.1	1 34 29.0	1.65	1.41
45 0	1 35 56.2	1 35 42.1	1 35 27.9	1 35 13.8	1 34 59.6	1 34 45.5	+1.67	−1.41
45 10	1 36 13.0	1 35 58.9	1 35 44.7	1 35 30.5	1 35 16.3	1 35 2.1	1.68	1.42
45 20	1 36 30.0	1 36 15.8	1 36 1.6	1 35 47.3	1 35 33.1	1 35 18.9	1.69	1.42
45 30	1 36 47.1	1 36 32.9	1 36 18.6	1 36 4.3	1 35 50.1	1 35 35.8	1.71	1.43
45 40	1 37 4.4	1 36 50.1	1 36 35.8	1 36 21.5	1 36 7.2	1 35 52.8	1.72	1.43
45 50	1 37 21.8	1 37 7.5	1 36 53.1	1 36 38.8	1 36 24.4	1 36 10.0	+1.74	−1.44
46 0	1 37 39.4	1 37 25.0	1 37 10.6	1 36 56.2	1 36 41.8	1 36 27.4	1.76	1.44
46 10	1 37 57.1	1 37 42.7	1 37 28.3	1 37 13.8	1 36 59.4	1 36 44.9	1.77	1.44
46 20	1 38 15.0	1 38 0.5	1 37 46.1	1 37 31.6	1 37 17.1	1 37 2.6	1.79	1.45
46 30	1 38 33.1	1 38 18.5	1 38 4.0	1 37 49.5	1 37 35.0	1 37 20.4	1.80	1.45
46 40	1 38 51.3	1 38 36.7	1 38 22.1	1 38 7.6	1 37 53.0	1 37 38.4	+1.82	−1.46
46 50	1 39 9.7	1 38 55.0	1 38 40.4	1 38 25.8	1 38 11.2	1 37 56.6	1.84	1.46
47 0	1 39 28.2	1 39 13.5	1 38 58.9	1 38 44.2	1 38 29.5	1 38 14.9	1.85	1.47
47 10	1 39 46.9	1 39 32.2	1 39 17.5	1 39 2.8	1 38 48.0	1 38 33.3	1.87	1.47
47 20	1 40 5.8	1 39 51.0	1 39 36.3	1 39 21.5	1 39 6.7	1 38 52.0	1.88	1.48
47 30	1 40 24.8	1 40 10.0	1 39 55.2	1 39 40.4	1 39 25.6	1 39 10.8	+1.90	−1.48
47 40	1 40 44.0	1 40 29.2	1 40 14.3	1 39 59.5	1 39 44.6	1 39 29.8	1.92	1.48
47 50	1 41 3.4	1 40 48.5	1 40 33.6	1 40 18.7	1 40 3.8	1 39 48.9	1.94	1.49
48 0	1 41 23.0	1 41 8.1	1 40 53.1	1 40 38.2	1 40 23.2	1 40 8.3	1.96	1.49
48 10	1 41 42.8	1 41 27.8	1 41 12.8	1 40 57.8	1 40 42.8	1 40 27.8	1.97	1.50
48 20	1 42 2.7	1 41 47.6	1 41 32.6	1 41 17.5	1 41 2.5	1 40 47.4	+1.99	−1.51
48 30	1 42 22.8	1 42 7.7	1 41 52.6	1 41 37.5	1 41 22.4	1 41 7.3	2.01	1.51
48 40	1 42 43.1	1 42 27.9	1 42 12.8	1 41 57.7	1 41 42.5	1 41 27.4	2.03	1.51
48 50	1 43 3.6	1 42 48.4	1 42 33.2	1 42 18.0	1 42 2.8	1 41 47.6	2.05	1.52
49 0	1 43 24.2	1 43 9.0	1 42 53.8	1 42 38.5	1 42 23.3	1 42 8.0	2.06	1.52
49 10	1 43 45 1	1 43 29.8	1 43 14.5	1 42 59.2	1 42 43.9	1 42 28.6	+2.08	−1.53
49 20	1 44 6 2	1 43 50.8	1 43 35.5	1 43 20.1	1 43 .4.8	1 42 49.4	2.10	1.54
49 30	1 44 27.4	1 44 12.0	1 43 56.6	1 43 41.2	1 43 25.8	1 43 10.4	2.12	1.54
49 40	1 44 48.9	1 44 33.4	1 44 18.0	1 44 2.5	1 43 47.1	1 43 31.6	2.14	1.55
49 50	1 45 10.5	1 44 55.0	1 44 39.5	1 44 24.0	1 44 8.5	1 43 53.0	2.16	1.55
50 0	*1 45 32.4*	1 45 16.8	1 45 1.3	1 44 45.7	1 44 30.1	1 44 14.6	+2.18	−1.56

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1919.

Decl. Lat.	88° 52′ 10″	88° 52′ 20″	88° 52′ 30″	88° 52′ 40″	88° 52′ 50″	88° 53′ 0″	Variation for—	
							1′ of Lat.	1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
50 0	1 45 32.4	1 45 16.8	1 45 1.3	1 44 45.7	1 44 30.1	1 44 14.6	+2.18	−1.56
50 10	1 45 54.4	1 45 38.8	1 45 23.2	1 45 7.6	1 44 52.0	1 44 36.4	2.20	1.56
50 20	1 46 16.7	1 46 1.1	1 45 45.4	1 45 29.7	1 45 14.0	1 44 58.4	2.22	1.57
50 30	1 46 39.2	1 46 23.5	1 46 7.7	1 45 52.0	1 45 36.3	1 45 20.6	2.24	1.57
50 40	1 47 1.9	1 46 46.1	1 46 30.3	1 46 14.5	1 45 58.8	1 45 43.0	2.27	1.58
50 50	1 47 24.8	1 47 9.0	1 46 53.1	1 46 37.3	1 46 21.5	1 46 5.6	+2.29	−1.58
51 0	1 47 47.9	1 47 32.0	1 47 16.1	1 47 0.2	1 46 44.4	1 46 28.5	2.31	1.59
51 10	1 48 11.3	1 47 55.3	1 47 39.4	1 47 23.4	1 47 7.5	1 46 51.5	2.34	1.60
51 20	1 48 34.9	1 48 18.9	1 48 2.9	1 47 46.8	1 47 30.8	1 47 14.8	2.36	1.60
51 30	1 48 58.7	1 48 42.6	1 48 26.5	1 48 10.5	1 47 54.4	1 47 38.3	2.38	1.61
51 40	1 49 22.7	1 49 6.6	1 48 50.4	1 48 34.3	1 48 18.2	1 48 2.1	+2.40	−1.61
51 50	1 49 47.0	1 49 30.8	1 49 14.6	1 48 58.4	1 48 42.2	1 48 26.0	2.43	1.62
52 0	1 50 11.5	1 49 55.2	1 49 39.0	1 49 22.7	1 49 6.5	1 48 50.2	2.45	1.63
52 10	1 50 36.2	1 50 19.9	1 50 3.6	1 49 47.3	1 49 31.0	1 49 14.7	2.47	1.63
52 20	1 51 1.2	1 50 44.8	1 50 28.5	1 50 12.1	1 49 55.7	1 49 39.4	2.50	1.64
52 30	1 51 26.4	1 51 10.0	1 50 53.6	1 50 37.1	1 50 20.7	1 50 4.3	+2.52	−1.64
52 40	1 51 51.9	1 51 35.4	1 51 18.9	1 51 2.4	1 50 45.9	1 50 29.5	2.55	1.65
52 50	1 52 17.7	1 52 1.1	1 51 44.5	1 51 28.0	1 51 11.4	1 50 54.9	2.57	1.66
53 0	1 52 43.6	1 52 27.0	1 52 10.4	1 51 53.8	1 51 37.2	1 51 20.5	2.60	1.66
53 10	1 53 9.9	1 52 53.2	1 52 36.5	1 52 19.8	1 52 3.2	1 51 46.5	2.62	1.67
53 20	1 53 36.4	1 53 19.7	1 53 2.9	1 52 46.1	1 52 29.4	1 52 12.7	+2.65	−1.67
53 30	1 54 3.2	1 53 46.4	1 53 29.6	1 53 12.7	1 52 55.9	1 52 39.1	2.68	1.68
53 40	1 54 30.2	1 54 13.4	1 53 56.5	1 53 39.6	1 53 22.7	1 53 5.8	2.70	1.69
53 50	1 54 57.6	1 54 40.6	1 54 23.7	1 54 6.7	1 53 49.8	1 53 32.8	2.73	1.70
54 0	1 55 25.1	1 55 8.1	1 54 51.1	1 54 34.1	1 54 17.1	1 54 0.1	2.76	1.70
54 10	1 55 53.0	1 55 35.9	1 55 18.8	1 55 1.8	1 54 44.7	1 54 27.6	+2.78	−1.71
54 20	1 56 21.2	1 56 4.0	1 55 46.9	1 55 29.7	1 55 12.6	1 54 55.4	2.81	1.72
54 30	1 56 49.6	1 56 32.4	1 56 15.2	1 55 58.0	1 55 40.7	1 55 23.5	2.84	1.72
54 40	1 57 18.4	1 57 1.1	1 56 43.8	1 56 26.5	1 56 9.2	1 55 51.9	2.87	1.73
54 50	1 57 47.4	1 57 30.1	1 57 12.7	1 56 55.3	1 56 38.0	1 56 20.6	2.90	1.74
55 0	1 58 16.8	1 57 59.3	1 57 41.9	1 57 24.4	1 57 7.0	1 56 49.6	+2.93	−1.74
55 10	1 58 46.4	1 58 28.9	1 58 11.4	1 57 53.9	1 57 36.3	1 57 18.8	2.96	1.75
55 20	1 59 16.4	1 58 58.8	1 58 41.2	1 58 23.6	1 58 6.0	1 57 48.4	2.99	1.76
55 30	1 59 46.6	1 59 29.0	1 59 11.4	1 58 53.7	1 58 36.0	1 58 18.3	3.02	1.77
55 40	2 0 17.2	1 59 59.5	1 59 41.8	1 59 24.0	1 59 6.3	1 58 48.5	3.05	1.77
55 50	2 0 48.1	2 0 30.3	2 0 12.5	1 59 54.7	1 59 36.9	1 59 19.1	+3.09	−1.78
56 0	2 1 19.4	2 1 1.5	2 0 43.6	2 0 25.7	2 0 7.8	1 59 49.9	3.12	1.79
56 10	2 1 51.0	2 1 33.0	2 1 15.0	2 0 57.0	2 0 39.1	2 0 21.1	3.16	1.80
56 20	2 2 22.9	2 2 4.8	2 1 46.8	2 1 28.7	2 1 10.7	2 0 52.6	3.19	1.81
56 30	2 2 55.1	2 2 37.0	2 2 18.9	2 2 0.7	2 1 42.6	2 1 24.5	3.22	1.81
56 40	2 3 27.7	2 3 9.5	2 2 51.3	2 2 33.1	2 2 14.9	2 1 56.7	+3.26	−1.82
56 50	2 4 0.7	2 3 42.4	2 3 24.1	2 3 5.8	2 2 47.5	2 2 29.2	3.29	1.83
57 0	2 4 34.0	2 4 15.6	2 3 57.2	2 3 38.9	2 3 20.5	2 3 2.1	3.33	1.84
57 10	2 5 7.7	2 4 49.2	2 4 30.8	2 4 12.3	2 3 53.9	2 3 35.4	3.36	1.85
57 20	2 5 41.7	2 5 23.2	2 5 4.6	2 4 46.1	2 4 27.6	2 4 9.0	3.40	1.85
57 30	2 6 16.1	2 5 57.5	2 5 38.9	2 5 20.3	2 5 1.6	2 4 43.0	+3.44	−1.86
57 40	2 6 50.9	2 6 32.2	2 6 13.5	2 5 54.8	2 5 36.1	2 5 17.4	3.48	1.87
57 50	2 7 26.1	2 7 7.3	2 6 48.5	2 6 29.7	2 6 11.0	2 5 52.2	3.52	1.88
58 0	2 8 1.7	2 7 42.8	2 7 23.9	2 7 5.1	2 6 46.2	2 6 27.3	3.56	1.89
58 10	2 8 37.7	2 8 18.7	2 7 59.7	2 7 40.8	2 7 21.8	2 7 2.8	3.60	1.90
58 20	2 9 14.0	2 8 55.0	2 8 35.9	2 8 16.9	2 7 57.8	2 7 38.8	+3.64	−1.90
58 30	2 9 50.8	2 9 31.7	2 9 12.6	2 8 53.4	2 8 34.2	2 8 15.1	3.68	1.91
58 40	2 10 28.1	2 10 8.8	2 9 49.6	2 9 30.3	2 9 11.1	2 8 51.9	3.72	1.92
58 50	2 11 5.7	2 10 46.4	2 10 27.0	2 10 7.7	2 9 48.4	2 9 29.0	3.76	1.93
59 0	2 11 43.8	2 11 24.3	2 11 4.9	2 10 45.5	2 10 26.0	2 10 6.6	3.80	1.94
59 10	2 12 22.3	2 12 2.7	2 11 43.2	2 11 23.7	2 11 4.2	2 10 44.6	+3.85	−1.95
59 20	2 13 1.2	2 12 41.6	2 12 22.0	2 12 2.4	2 11 42.7	2 11 23.1	3.89	1.96
59 30	2 13 40.6	2 13 20.9	2 13 1.2	2 12 41.5	2 12 21.7	2 12 2.0	3.94	1.97
59 40	2 14 20.5	2 14 0.6	2 13 40.8	2 13 21.0	2 13 1.2	2 12 41.4	3.99	1.98
59 50	2 15 0.8	2 14 40.9	2 14 21.0	2 14 1.1	2 13 41.1	2 13 21.2	4.04	1.99
60 0	2 15 41.6	2 15 21.6	2 15 1.6	2 14 41.6	2 14 21.5	2 14 1.5	+4.08	−2.00

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1919.

Decl. / Lat.	88° 52′ 10″	88° 52′ 20″	88° 52′ 30″	88° 52′ 40″	88° 52′ 50″	88° 53′ 0″	Variation for—	
							1′ of Lat.	1″ of δ
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
60 0	2 15 41.6	2 15 21.6	2 15 1.6	2 14 41.6	2 14 21.5	2 14 1.5	+4.08	−2.00
60 10	2 16 22.9	2 16 2.8	2 15 42.6	2 15 22.5	2 15 2.4	2 14 42.3	4.13	2.01
60 20	2 17 4.6	2 16 44.4	2 16 24.2	2 16 4.0	2 15 43.8	2 15 23.6	4.18	2.02
60 30	2 17 46.9	2 17 26.6	2 17 6.3	2 16 46.0	2 16 25.6	2 16 5.3	4.23	2.03
60 40	2 18 29.7	2 18 9.3	2 17 48.8	2 17 28.4	2 17 8.0	2 16 47.6	4.28	2.04
60 50	2 19 13.0	2 18 52.5	2 18 31.9	2 18 11.4	2 17 50.9	2 17 30.3	+4.33	−2.05
61 0	2 19 56.8	2 19 36.2	2 19 15.5	2 18 54.9	2 18 34.3	2 18 13.6	4.38	2.06
61 10	2 20 41.2	2 20 20.4	2 19 59.7	2 19 38.9	2 19 18.2	2 18 57.4	4.44	2.08
61 20	2 21 26.1	2 21 5.2	2 20 44.4	2 20 23.5	2 20 2.6	2 19 41.8	4.49	2.09
61 30	2 22 11.5	2 21 50.6	2 21 29.6	2 21 8.6	2 20 47.6	2 20 26.7	4.54	2.10
61 40	2 22 57.5	2 22 36.5	2 22 15.4	2 21 54.3	2 21 33.2	2 21 12.1	+4.60	−2.11
61 50	2 23 44.1	2 23 23.0	2 23 1.8	2 22 40.6	2 22 19.4	2 21 58.1	4.66	2.12
62 0	2 24 31.3	2 24 10.0	2 23 48.7	2 23 27.4	2 23 6.1	2 22 44.7	4.72	2.13
62 10	2 25 19.1	2 24 57.6	2 24 36.2	2 24 14.8	2 23 53.3	2 23 31.9	4.78	2.14
62 20	2 26 7.4	2 25 45.9	2 25 24.3	2 25 2.8	2 24 41.2	2 24 19.7	4.84	2.15
62 30	2 26 56.4	2 26 34.8	2 26 13.1	2 25 51.4	2 25 29.7	2 25 8.1	+4.90	−2.17
62 40	2 27 46.0	2 27 24.3	2 27 2.5	2 26 40.7	2 26 18.9	2 25 57.1	4.96	2.18
62 50	2 28 36.3	2 28 14.4	2 27 52.5	2 27 30.5	2 27 8.6	2 26 46.7	5.02	2.19
63 0	2 29 27.2	2 29 5.1	2 28 43.1	2 28 21.1	2 27 59.0	2 27 37.0	5.09	2.20
63 10	2 30 18.8	2 29 56.6	2 29 34.4	2 29 12.2	2 28 50.1	2 28 27.9	5.16	2.22
63 20	2 31 11.0	2 30 48.7	2 30 26.4	2 30 4.1	2 29 41.8	2 29 19.5	+5.22	−2.23
63 30	2 32 3.9	2 31 41.5	2 31 19.0	2 30 56.6	2 30 34.2	2 30 11.8	5.29	2.24
63 40	2 32 57.5	2 32 35.0	2 32 12.4	2 31 49.8	2 31 27.3	2 31 4.7	5.37	2.26
63 50	2 33 51.8	2 33 29.2	2 33 6.5	2 32 43.8	2 32 21.1	2 31 58.4	5.44	2.27
64 0	2 34 46.9	2 34 24.1	2 34 1.2	2 33 38.4	2 33 15.6	2 32 52.8	5.51	2.28
64 10	2 35 42.7	2 35 19.7	2 34 56.8	2 34 33.8	2 34 10.8	2 33 47.9	+5.58	−2.30
64 20	2 36 39.3	2 36 16.1	2 35 53.0	2 35 29.9	2 35 6.8	2 34 43.7	5.66	2.31
64 30	2 37 36.6	2 37 13.3	2 36 50.1	2 36 26.8	2 36 3.6	2 35 40.3	5.74	2.33
64 40	2 38 34.7	2 38 11.3	2 37 47.9	2 37 24.5	2 37 1.1	2 36 37.7	5.82	2.34
64 50	2 39 33.6	2 39 10.1	2 38 46.5	2 38 23.0	2 37 59.4	2 37 35.9	5.90	2.35
65 0	2 40 33.3	2 40 9.6	2 39 45.9	2 39 22.3	2 38 58.6	2 38 34.9	+5.98	−2.37
65 10	2 41 33.9	2 41 10.0	2 40 46.2	2 40 22.4	2 39 58.5	2 39 34.7	6.06	2.38
65 20	2 42 35.3	2 42 11.3	2 41 47.3	2 41 23.3	2 40 59.3	2 40 35.4	6.14	2.40
65 30	2 43 37.6	2 43 13.4	2 42 49.3	2 42 25.1	2 42 1.0	2 41 36.9	6.23	2.41
65 40	2 44 40.7	2 44 16.4	2 43 52.1	2 43 27.8	2 43 3.5	2 42 39.2	6.32	2.43
65 50	2 45 44.8	2 45 20.3	2 44 55.9	2 44 31.4	2 44 7.0	2 43 42.5	+6.41	−2.45
66 0	2 46 49.8	2 46 25.1	2 46 0.5	2 45 35.9	2 45 11.3	2 44 46.7	6.51	2.46
66 10	2 47 55.7	2 47 30.9	2 47 6.1	2 46 41.3	2 46 16.6	2 45 51.8	6.61	2.48
66 20	2 49 2.6	2 48 37.6	2 48 12.7	2 47 47.7	2 47 22.8	2 46 57.9	6.70	2.49
66 30	2 50 10.4	2 49 45.3	2 49 20.2	2 48 55.1	2 48 30.0	2 48 4.9	6.80	2.51
66 40	2 51 19.3	2 50 54.0	2 50 28.7	2 50 3.5	2 49 38.2	2 49 12.9	+6.90	−2.53
66 50	2 52 29.2	2 52 3.7	2 51 38.3	2 51 12.8	2 50 47.4	2 50 22.0	7.00	2.54
67 0	2 53 40.1	2 53 14.5	2 52 48.9	2 52 23.3	2 51 57.6	2 51 32.0	7.11	2.56
67 10	2 54 52.1	2 54 26.3	2 54 0.5	2 53 34.7	2 53 8.9	2 52 43.1	7.21	2.58
67 20	2 56 5.2	2 55 39.3	2 55 13.3	2 54 47.3	2 54 21.3	2 53 55.3	7.32	2.60
67 30	2 57 19.4	2 56 53.3	2 56 27.1	2 56 1.0	2 55 34.8	2 55 8.6	+7.43	−2.62
67 40	2 58 34.8	2 58 8.5	2 57 42.1	2 57 15.8	2 56 49.4	2 56 23.1	7.55	2.63
67 50	2 59 51.3	2 59 24.8	2 58 58.3	2 58 31.7	2 58 5.2	2 57 38.7	7.67	2.65
68 0	3 1 9.0	3 0 42.3	3 0 15.6	2 59 48.9	2 59 22.1	2 58 55.4	7.79	2.67
68 10	3 2 28.0	3 2 1.1	3 1 34.2	3 1 7.2	3 0 40.3	3 0 13.4	7.91	2.69
68 20	3 3 48.2	3 3 21.1	3 2 54.0	3 2 26.8	3 1 59.7	3 1 32.6	+8.03	−2.71
68 30	3 5 9.7	3 4 42.3	3 4 15.0	3 3 47.7	3 3 20.4	3 2 53.1	8.16	2.73
68 40	3 6 32.4	3 6 4.9	3 5 37.4	3 5 9.9	3 4 42.3	3 4 14.8	8.29	2.75
68 50	3 7 56.6	3 7 28.8	3 7 1.1	3 6 33.4	3 6 5.6	3 5 37.9	8.43	2.77
69 0	3 9 22.1	3 8 54.1	3 8 26.2	3 7 58.2	3 7 30.3	3 7 2.3	8.57	2.80
69 10	3 10 49.0	3 10 20.8	3 9 52.6	3 9 24.5	3 8 56.3	3 8 28.2	+8.71	−2.82
69 20	3 12 17.3	3 11 48.9	3 11 20.5	3 10 52.2	3 10 23.8	3 9 55.4	8.85	2.84
69 30	3 13 47.1	3 13 18.5	3 12 49.9	3 12 21.3	3 11 52.7	3 11 24.1	9.00	2.86
69 40	3 15 18.4	3 14 49.6	3 14 20.8	3 13 51.9	3 13 23.1	3 12 54.3	9.15	2.88
69 50	3 16 51.3	3 16 22.2	3 15 53.2	3 15 24.1	3 14 55.1	3 14 26.0	9.31	2.91
70 0	*3 18 25.7*	3 17 56.4	3 17 27.2	3 16 57.9	3 16 28.6	3 15 59.3	+9.47	−2.93

FOR REDUCING TO ELONGATION OBSERVATIONS MADE NEAR ELONGATION.

Azimuth at Elong. * Time.	1° 0′	1° 10′	1° 20′	1° 30′	1° 40′	1° 50′	2° 0′	2° 10′	Azimuth at Elong. Time.*
m	″	″	″	″	″	″	″	″	m
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1	0.0	0.0	0.0	+ 0.1	+ 0.1	+ 0.1	+0.1	+ 0.1	1
2	+ 0.1	+ 0.2	+ 0.2	0.2	0.2	0.3	0.3	0.3	2
3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	3
4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	4
5	+ 0.9	+ 1.0	+ 1.1	+ 1.3	+ 1.4	+ 1.6	+ 1.7	+ 1.9	5
6	1.2	1.4	1.6	1.8	2.1	2.3	2.5	2.7	6
7	1.7	2.0	2.2	2.5	2.8	3.1	3.4	3.7	7
8	2.2	2.6	2.9	3.3	3.7	4.0	4.4	4.8	8
9	2.8	3.2	3.7	4.2	4.6	5.1	5.6	6.0	9
10	+ 3.4	+ 4.0	+ 4.6	+ 5.1	+ 5.7	+ 6.3	+ 6.9	+ 7.4	10
11	4.1	4.8	5.5	6.2	6.9	7.6	8.3	9.0	11
12	4.9	5.8	6.6	7.4	8.2	9.0	9.9	10.7	12
13	5.8	6.8	7.7	8.7	9.7	10.6	11.6	12.6	13
14	6.7	7.8	9.0	10.1	11.2	12.3	13.4	14.6	14
15	+ 7.7	+ 9.0	+10.3	+11.6	+12.8	+14.1	+15.4	+16.7	15
16	8.8	10.2	11.7	13.2	14.6	16.1	17.5	19.0	16
17	9.9	11.5	13.2	14.9	16.5	18.2	19.8	21.5	17
18	11.1	12.9	14.8	16.7	18.5	20.4	22.2	24.1	18
19	12.4	14.4	16.5	18.6	20.6	22.7	24.7	26.8	19
20	+13.7	+16.0	+18.3	+20.6	+22.8	+25.1	+27.4	+29.7	20
21	15.1	17.6	20.1	22.7	25.2	27.7	30.2	32.7	21
22	16.6	19.3	22.1	24.9	27.6	30.4	33.2	35.9	22
23	18.1	21.1	24.2	27.2	30.2	33.2	36.2	39.3	23
24	19.7	23.0	26.3	29.6	32.9	36.2	39.5	42.8	24
25	+21.4	+25.0	+28.5	+32.1	+35.7	+39.2	+42.8	+46.4	25

Azimuth at Elong. * Time.	2° 10′	2° 20′	2° 30′	2° 40′	2° 50′	3° 0′	3° 10′	3° 20′	Azimuth at Elong. Time.*
m	″	″	″	″	″	″	″	″	m
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	1
2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	2
3	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0	3
4	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.8	4
5	+ 1.9	+ 2.0	+ 2.1	+ 2.3	+ 2.4	+ 2.6	+ 2.7	+ 2.9	5
6	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	6
7	3.7	3.9	4.2	4.5	4.8	5.0	5.3	5.6	7
8	4.8	5.1	5.5	5.9	6.2	6.6	7.0	7.3	8
9	6.0	6.5	7.0	7.4	7.9	8.3	8.8	9.3	9
10	+ 7.4	+ 8.0	+ 8.6	+ 9.2	+ 9.7	+10.3	+10.9	+11.4	10
11	9.0	9.7	10.4	11.1	11.8	12.4	13.1	13.8	11
12	10.7	11.5	12.3	13.2	14.0	14.8	15.6	16.5	12
13	12.6	13.5	14.5	15.4	16.4	17.4	18.4	19.3	13
14	14.6	15.7	16.8	17.9	19.0	20.2	21.3	22.4	14
15	+16.7	+18.0	+19.3	+20.6	+21.9	+23.1	+24.4	+25.7	15
16	19.0	20.5	21.9	23.4	24.9	26.3	27.8	29.3	16
17	21.5	23.1	24.8	26.4	28.1	29.7	31.4	33.0	17
18	24.1	25.9	27.8	29.6	31.5	33.3	35.2	37.0	18
19	26.8	28.9	30.9	33.0	35.1	37.1	39.2	41.3	19
20	+29.7	+32.0	+34.3	+36.6	+38.8	+41.1	+43.4	+45.7	20
21	32.7	35.3	37.8	40.3	42.8	45.3	47.9	50.4	21
22	35.9	38.7	41.5	44.2	47.0	49.8	52.5	55.3	22
23	39.3	42.3	45.3	48.3	51.4	54.4	57.4	60.4	23
24	42.8	46.0	49.3	52.6	55.9	59.2	62.5	65.8	24
25	+46.4	+49.9	+53.5	+57.1	+60.7	+64.2	+67.8	+71.4	25

* Sidereal time from elongation.

TABLE VI.

FOR FINDING THE TIMES OF UPPER AND LOWER CULMINATION OF POLARIS, 1919, FROM THE OBSERVED TIMES WHEN THE STAR IS ON THE SAME VERTICAL CIRCLE WITH THE STARS ζ URSÆ MAJORIS (MIZAR) *SUB POLO* AND δ CASSIOPEIÆ *SUB POLO*, RESPECTIVELY.

Except at high latitudes, the pole star at either upper or lower culmination furnishes a simple and convenient method for laying down a meridian line on the earth's surface at points in the northern hemisphere. When the local time is unknown and accurate astronomical instruments are not available, the time of culmination of Polaris may be found by observing the instant when Polaris is vertically above (has the same azimuth as) ζ Ursæ Majoris (Mizar) below the pole, or δ Cassiopeiæ below the pole. In the former case, for the year 1919, Polaris is approaching upper culmination and in the latter case it is approaching lower culmination. The mean time interval which elapses between either of the observed times above mentioned and upper or lower culmination, as the case may be, is given at ten-day intervals in the following table. This method can not be used at places south of 30° north latitude.

ζ URSÆ MAJORIS (MIZAR).
(Upper culmination of Polaris.)

Date.	Lat.	40°	45°	50°	55°	60°
		m s	m s	m s	m s	m s
Jan.	1	10 37	10 35	10 33	10 30	10 26
	11	10 27	10 25	10 23	10 20	10 16
	21	10 16	10 14	10 12	10 9	10 5
	31	10 6	10 4	10 1	9 58	9 55
Feb.	10	9 55	9 53	9 51	9 48	9 45
	20	9 46	9 44	9 42	9 39	9 36
Mar.	2	9 38	9 36	9 34	9 31	9 28
June	30	10 20	10 18	10 16	10 13	10 9
July	10	10 31	10 29	10 27	10 24	10 20
	20	10 42	10 40	10 38	10 35	10 31
	30	10 53	10 51	10 49	10 46	10 42
Aug.	9	11 4	11 2	10 59	10 56	10 52
	19	11 14	11 12	11 9	11 6	11 2
	29	11 23	11 21	11 18	11 15	11 11
Sept.	8	11 31	11 28	11 26	11 22	11 18
	18	11 37	11 35	11 32	11 29	11 25
	28	11 43	11 40	11 38	11 34	11 30
Oct.	8	11 46	11 44	11 41	11 38	11 34
	18	11 49	11 46	11 44	11 40	11 36
	28	11 49	11 47	11 44	11 41	11 36
Nov.	7	11 48	11 45	11 43	11 39	11 35
	17	11 45	11 42	11 40	11 36	11 32
	27	11 40	11 37	11 35	11 32	11 27
Dec.	7	11 33	11 31	11 28	11 25	11 21
	17	11 25	11 23	11 21	11 17	11 13
	27	11 16	11 14	11 11	11 8	11 4
	31	11 12	11 10	11 8	11 4	11 0

δ CASSIOPEIÆ.
(Lower culmination of Polaris.)

Date.	Lat.	35°	40°	45°	50°	55°
		m s	m s	m s	m s	m s
Jan.	1	11 46	11 48	11 51	11 53	11 56
	11	11 36	11 38	11 40	11 42	11 46
	21	11 25	11 27	11 29	11 31	11 35
	31	11 14	11 16	11 18	11 21	11 24
Feb.	10	11 4	11 6	11 8	11 10	11 13
	20	10 54	10 56	10 58	11 1	11 4
Mar.	2	10 46	10 48	10 50	10 52	10 55
	12	10 40	10 41	10 43	10 46	10 49
	22	10 35	10 37	10 39	10 41	10 44
Apr.	1	10 32	10 34	10 36	10 38	10 41
	11	10 32	10 34	10 36	10 38	10 41
	21	10 33	10 35	10 37	10 40	10 42
May	1	10 37	10 39	10 41	10 43	10 46
	11	10 42	10 44	10 46	10 49	10 52
	21	10 50	10 51	10 53	10 56	10 59
	31	10 58	11 0	11 2	11 4	11 7
June	10	11 8	11 9	11 11	11 14	11 17
	20	11 18	11 20	11 22	11 25	11 28
	30	11 29	11 31	11 33	11 36	11 39
July	10	11 41	11 42	11 45	11 47	11 50
	20	11 52	11 54	11 56	11 59	12 2
July	30	12 3	12 5	12 7	12 10	12 13
Nov.	27	12 51	12 53	12 55	12 58	13 1
Dec.	7	12 44	12 46	12 48	12 51	12 55
	17	12 36	12 38	12 40	12 43	12 46
	27	12 26	12 28	12 31	12 33	12 37
	31	12 22	12 24	12 27	12 29	12 33

APPARENT PLACE, TIME OF UPPER CULMINATION, AND TIME INTERVAL BETWEEN UPPER CULMINATION AND ELONGATION EAST OR WEST, OF POLARIS, 1919.

The local mean time of culmination on any meridian for a given date is found by taking from the following table the *Mean Time* of the nearest Greenwich culmination, and applying to it the product of the *Var. per Day* by the integral number of intervening days, this product being numerically additive for an earlier date and subtractive for a later date than that given in the table; and by applying also the product of the *Var. per Hour* by the longitude from Greenwich expressed in hours and fractions of an hour, this product being numerically additive for East longitudes and subtractive for West longitudes.

The time interval between upper and lower culmination is 12h diminished by one-half the numerical value of the *Var. per Day*.

The last column below applies to all meridians.

Date.	Upper Culmination, Meridian of Greenwich.					Latitude.	Mean Time Interval, Elongation *minus* Upper Culm.
	Apparent Right Ascension.	Apparent Declination.	Mean Time.	Var. per Day.	Var. per Hour.		
	h m 1 30	° ′ +88 52			W. E.		W. E.
	s	″	h m s	m s	s	°	h m
Jan. 1	108	45.3	6 50 20	−3 56.9	−9.87+	10	+5 58.2−
11	98	46.3	6 10 50	3 57.0	9.87	12	5 58.1
21	87	46.6	5 31 20	3 57.0	9.87	14	5 57.9
31	76	46.3	4 51 51	3 57.0	9.87	16	5 57.7
Feb. 10	66	45.3	4 12 21	3 56.9	9.87	18	5 57.6
20	57	43.7	3 32 53	−3 56.8	−9.87+	20	+5 57.4−
Mar. 2	49	41.6	2 53 26	3 56.6	9.86	22	5 57.2
12	42	39.1	2 14 0	3 56.5	9.85	24	5 57.0
22	38	36.2	1 34 37	3 56.3	9.84	26	5 56.8
Apr. 1	35	33.1	0 55 15	3 56.1	9.84	28	5 56.6
11	34	30.0	0 15 55	−3 55.9	−9.83+	30	+5 56.4−
20	36	26.9	23 36 38	3 55.7	9.82	32	5 56.2
30	39	23.9	22 57 22	3 55.5	9.81	34	5 56.0
May 10	45	21.2	22 18 8	3 55.3	9.80	36	5 55.8
20	52	18.8	21 38 56	3 55.1	9.80	38	5 55.5
30	60	16.8	20 59 45	−3 55.0	−9.79+	40	+5 55.3−
June 9	70	15.3	20 20 36	3 54.9	9.79	42	5 55.0
19	80	14.4	19 41 27	3 54.8	9.78	44	5 54.7
29	91	13.9	19 2 19	3 54.8	9.78	46	5 54.4
July 9	103	14.1	18 23 11	3 54.8	9.78	48	5 54.0
19	114	14.7	17 44 4	−3 54.8	−9.78+	50	+5 53.7−
29	125	15.9	17 4 56	3 54.8	9.78	52	5 53.3
Aug. 8	136	17.6	16 25 48	3 54.9	9.79	54	5 52.9
18	146	19.7	15 46 39	3 54.9	9.79	56	5 52.4
28	156	22.2	15 7 29	3 55.0	9.79	58	5 51.8
Sept. 7	164	25.1	14 28 18	−3 55.2	−9.80+	60	+5 51.3−
17	171	28.4	13 49 6	3 55.3	9.80	62	5 50.6
27	176	31.8	13 9 52	3 55.4	9.81	64	5 49.8
Oct. 7	180	35.5	12 30 37	3 55.6	9.82	66	5 49.0
17	183	39.2	11 51 20	3 55.8	9.82	68	5 47.9
27	183	43.0	11 12 2	−3 55.9	−9.83+	70	+5 46.7−
Nov. 6	182	46.7	10 32 42	3 56.1	9.84		
16	179	50.2	9 53 20	3 56.3	9.85		
26	175	53.4	9 13 56	3 56.5	9.85		
Dec. 6	168	56.3	8 34 31	3 56.6	9.86		
16	161	58.8	7 55 4	−3 56.8	−9.86+		
26	152	60.8	7 15 36	−3 56.9	−9.87+		

TABLE VIII.

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 720.

Date. Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan. 0	17 59	18 17	18 35	18 56	19 8	19 22	19 38	19 59	20 8	20 19	20 32	20 46	21 3
1	18 0	18 17	18 35	18 56	19 8	19 22	19 39	19 59	20 8	20 19	20 32	20 46	21 3
2	18 0	18 18	18 36	18 56	19 8	18 22	19 39	19 59	20 8	20 19	20 31	20 46	21 2
3	18 1	18 18	18 36	18 57	19 9	19 22	19 39	19 59	20 8	20 19	20 31	20 45	21 2
4	18 1	18 18	18 36	18 57	19 9	19 22	19 38	19 58	20 8	20 18	20 30	20 44	21 1
5	18 2	18 19	18 36	18 57	19 9	19 22	19 38	19 58	20 8	20 18	20 30	20 44	21 0
6	18 2	18 19	18 37	18 57	19 9	19 22	19 38	19 58	20 7	20 18	20 30	20 43	20 59
7	18 3	18 19	18 37	18 57	19 9	19 22	19 38	19 58	20 7	20 17	20 29	20 42	20 58
8	18 3	18 20	18 37	18 57	19 9	19 22	19 38	19 57	20 6	20 16	20 28	20 42	20 57
9	18 4	18 20	18 37	18 57	19 9	19 22	19 38	19 57	20 6	20 16	20 28	20 41	20 56
10	18 4	18 20	18 38	18 57	19 9	19 22	19 37	19 56	20 5	20 15	20 27	20 40	20 55
11	18 4	18 20	18 38	18 57	19 9	19 22	19 37	19 56	20 5	20 14	20 26	20 39	20 54
12	18 5	18 21	18 38	18 57	19 8	19 21	19 36	19 55	20 4	20 14	20 25	20 38	20 52
13	18 5	18 21	18 38	18 57	19 8	19 21	19 36	19 54	20 3	20 13	20 24	20 36	20 51
14	18 6	18 21	18 38	18 57	19 8	19 21	19 36	19 54	20 2	20 12	20 23	20 35	20 50
15	18 6	18 21	18 38	18 57	19 8	19 20	19 35	19 53	20 2	20 11	20 22	20 34	20 48
16	18 6	18 22	18 38	18 57	19 8	19 20	19 34	19 52	20 1	20 10	20 21	20 33	20 47
17	18 7	18 22	18 38	18 56	19 7	19 19	19 34	19 51	20 0	20 9	20 19	20 31	20 45
18	18 7	18 22	18 38	18 56	19 7	19 19	19 33	19 50	19 59	20 8	20 18	20 30	20 43
19	18 7	18 22	18 38	18 56	19 6	19 18	19 32	19 49	19 58	20 6	20 17	20 28	20 42
20	18 8	18 22	18 38	18 56	19 6	19 18	19 32	19 48	19 57	20 5	20 15	20 27	20 40
21	18 8	18 22	18 38	18 56	19 6	19 17	19 31	19 47	19 56	20 4	20 14	20 25	20 38
22	18 8	18 23	18 38	18 55	19 5	19 17	19 30	19 46	19 54	20 3	20 12	20 23	20 36
23	18 8	18 23	18 38	18 55	19 5	19 16	19 29	19 45	19 53	20 1	20 11	20 22	20 34
24	18 9	18 23	18 38	18 54	19 4	19 15	19 28	19 44	19 52	20 0	20 9	20 20	20 32
25	18 9	18 23	18 37	18 54	19 4	19 15	19 28	19 43	19 50	19 59	20 8	20 18	20 30
26	18 9	18 23	18 37	18 54	19 3	19 14	19 27	19 42	19 49	19 57	20 6	20 16	20 28
27	18 9	18 23	18 37	18 53	19 2	19 13	19 26	19 41	19 48	19 56	20 4	20 14	20 26
28	18 10	18 23	18 37	18 53	19 2	19 12	19 25	19 40	19 46	19 54	20 3	20 12	20 24
29	18 10	18 23	18 36	18 52	19 1	19 12	19 24	19 38	19 45	19 52	20 1	20 10	20 21
30	18 10	18 23	18 36	18 52	19 0	19 11	19 22	19 37	19 43	19 51	19 59	20 8	20 19
31	18 10	18 23	18 36	18 51	19 0	19 10	19 21	19 35	19 42	19 49	19 57	20 6	20 17
Feb. 1	18 10	18 22	18 36	18 50	18 59	19 9	19 20	19 34	19 40	19 47	19 55	20 4	20 14
2	18 10	18 22	18 35	18 50	18 58	19 8	19 19	19 32	19 39	19 46	19 53	20 2	20 12
3	18 10	18 22	18 35	18 49	18 58	19 7	19 18	19 31	19 37	19 44	19 51	20 0	20 10
4	18 10	18 22	18 35	18 49	18 57	19 6	19 17	19 30	19 36	19 42	19 49	19 58	20 7
5	18 10	18 22	18 34	18 48	18 56	19 5	19 15	19 28	19 34	19 40	19 47	19 56	20 5
6	18 11	18 22	18 34	18 47	18 55	19 4	19 14	19 26	19 32	19 38	19 45	19 53	20 2
7	18 11	18 22	18 33	18 47	18 54	19 3	19 13	19 25	19 30	19 36	19 43	19 51	20 0
8	18 11	18 22	18 33	18 46	18 53	19 2	19 11	19 23	19 28	19 34	19 41	19 49	19 57
9	18 11	18 21	18 32	18 45	18 52	19 0	19 10	19 22	19 27	19 33	19 39	19 46	19 55
10	18 11	18 21	18 32	18 44	18 51	18 59	19 9	19 20	19 25	19 31	19 37	19 44	19 52
11	18 11	18 21	18 32	18 44	18 50	18 58	19 7	19 18	19 23	19 28	19 35	19 42	19 49
12	18 11	18 21	18 31	18 43	18 49	18 57	19 6	19 16	19 21	19 26	19 32	19 39	19 47
13	18 11	18 20	18 30	18 42	18 48	18 56	19 4	19 15	19 19	19 24	19 30	19 37	19 44
14	18 11	18 20	18 30	18 41	18 47	18 54	19 3	19 13	19 17	19 22	19 28	19 34	19 41
15	18 11	18 20	18 29	18 40	18 46	18 53	19 1	19 11	19 15	19 20	19 26	19 32	19 39

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 720.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan. 1	6 7	5 50	5 32	5 11	4 59	4 45	4 28	4 8	3 58	3 48	3 35	3 21	3 4
2	6 8	5 51	5 32	5 12	5 0	4 46	4 29	4 9	3 59	3 49	3 36	3 22	3 5
3	6 8	5 51	5 33	5 12	5 0	4 46	4 30	4 10	4 0	3 50	3 38	3 24	3 7
4	6 8	5 51	5 34	5 13	5 1	4 47	4 31	4 11	4 2	3 51	3 39	3 25	3 8
5	6 9	5 52	5 34	5 14	5 2	4 48	4 32	4 12	4 3	3 52	3 40	3 26	3 10
6	6 9	5 53	5 35	5 14	5 3	4 49	4 33	4 13	4 4	3 54	3 42	3 28	3 12
7	6 10	5 53	5 36	5 15	5 4	4 50	4 34	4 14	4 5	3 55	3 43	3 30	3 14
8	6 10	5 54	5 36	5 16	5 4	4 51	4 35	4 16	4 7	3 56	3 45	3 31	3 15
9	6 11	5 54	5 37	5 17	5 5	4 52	4 36	4 17	4 8	3 58	3 46	3 33	3 17
10	6 11	5 55	5 38	5 18	5 6	4 53	4 38	4 18	4 9	3 59	3 48	3 35	3 19
11	6 12	5 55	5 38	5 18	5 7	4 54	4 39	4 20	4 11	4 1	3 50	3 36	3 21
12	6 12	5 56	5 39	5 19	5 8	4 55	4 40	4 21	4 12	4 2	3 51	3 38	3 23
13	6 12	5 56	5 39	5 20	5 9	4 56	4 41	4 22	4 14	4 4	3 53	3 40	3 26
14	6 13	5 57	5 40	5 21	5 10	4 57	4 42	4 24	4 15	4 6	3 55	3 42	3 28
15	6 13	5 57	5 41	5 22	5 11	4 58	4 43	4 25	4 17	4 7	3 56	3 44	3 30
16	6 13	5 58	5 41	5 23	5 12	4 59	4 45	4 27	4 18	4 9	3 58	3 46	3 32
17	6 14	5 58	5 42	5 24	5 13	5 0	4 46	4 28	4 20	4 11	4 0	3 48	3 34
18	6 14	5 59	5 43	5 24	5 14	5 2	4 47	4 30	4 22	4 12	4 2	3 50	3 37
19	6 14	5 59	5 43	5 25	5 15	5 3	4 49	4 31	4 23	4 14	4 4	3 52	3 39
20	6 14	6 0	5 44	5 26	5 16	5 4	4 50	4 33	4 25	4 16	4 6	3 55	3 41
21	6 15	6 0	5 45	5 27	5 17	5 5	4 51	4 34	4 26	4 18	4 8	3 57	3 44
22	6 15	6 1	5 45	5 28	5 18	5 6	4 52	4 36	4 28	4 20	4 10	3 59	3 46
23	6 16	6 1	5 46	5 29	5 19	5 7	4 54	4 38	4 30	4 22	4 12	4 1	3 49
24	6 16	6 2	5 47	5 30	5 20	5 8	4 55	4 39	4 32	4 24	4 14	4 4	3 51
25	6 16	6 2	5 47	5 30	5 21	5 10	4 57	4 41	4 34	4 25	4 16	4 6	3 54
26	6 16	6 2	5 48	5 31	5 22	5 11	4 58	4 43	4 35	4 27	4 18	4 8	3 56
27	6 16	6 3	5 48	5 32	5 23	5 12	4 59	4 44	4 37	4 29	4 20	4 10	3 59
28	6 17	6 3	5 49	5 33	5 24	5 13	5 1	4 46	4 39	4 31	4 22	4 13	4 1
29	6 17	6 4	5 50	5 34	5 25	5 14	5 2	4 48	4 41	4 33	4 24	4 15	4 4
30	6 17	6 4	5 50	5 35	5 26	5 16	5 4	4 49	4 42	4 35	4 27	4 17	4 6
31	6 17	6 4	5 51	5 36	5 27	5 17	5 5	4 51	4 44	4 37	4 29	4 20	4 9
Feb. 1	6 17	6 5	5 52	5 36	5 28	5 18	5 6	4 53	4 46	4 39	4 31	4 22	4 12
2	6 17	6 5	5 52	5 37	5 29	5 19	5 8	4 54	4 48	4 41	4 33	4 24	4 14
3	6 18	6 5	5 53	5 38	5 30	5 20	5 9	4 56	4 50	4 43	4 35	4 27	4 17
4	6 18	6 6	5 53	5 39	5 31	5 22	5 11	4 58	4 52	4 45	4 38	4 29	4 20
5	6 18	6 6	5 54	5 40	5 32	5 23	5 12	5 0	4 54	4 47	4 40	4 32	4 22
6	6 18	6 6	5 54	5 41	5 33	5 24	5 14	5 1	4 55	4 49	4 42	4 34	4 25
7	6 18	6 7	5 55	5 42	5 34	5 25	5 15	5 3	4 57	4 51	4 44	4 36	4 28
8	6 18	6 7	5 55	5 42	5 35	5 26	5 16	5 5	4 59	4 53	4 46	4 39	4 30
9	6 18	6 7	5 56	5 43	5 36	5 28	5 18	5 6	5 1	4 55	4 49	4 41	4 33
10	6 18	6 8	5 56	5 44	5 37	5 29	5 19	5 8	5 3	4 57	4 51	4 44	4 35
11	6.18	6 8	5 57	5 45	5 38	5 30	5 21	5 10	5 5	4 59	4 53	4 46	4 38
12	6 18	6 8	5 58	5 46	5 39	5 31	5 22	5 12	5 7	5 1	4 55	4 48	4 41
13	6 18	6 8	5 58	5 46	5 40	5 32	5 24	5 13	5 8	5 3	4 57	4 51	4 43
14	6 18	6 8	5 58	5 47	5 41	5 34	5 25	5 15	5 10	5 5	5 0	4 53	4 46
15	6 18	6 8	5 59	5 48	5 42	5 35	5 26	5 17	5 12	5 7	5 2	4 56	4 49
16	6 18	6 9	5 59	5 49	5 43	5 36	5 28	5 18	5 14	5 9	5 4	4 58	4 51

TABLE VIII.

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 720.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Feb. 15	18 11	18 20	18 29	18 40	18 46	18 53	19 1	19 11	19 15	19 20	19 26	19 32	19 39
16	18 11	18 20	18 29	18 39	18 45	18 52	19 0	19 9	19 14	19 18	19 23	19 29	19 36
17	18 11	18 19	18 28	18 38	18 44	18 51	18 58	19 7	19 12	19 16	19 21	19 27	19 33
18	18 11	18 19	18 28	18 37	18 43	18 49	18 57	19 5	19 10	19 14	19 19	19 24	19 30
19	18 10	18 19	18 27	18 36	18 42	18 48	18 55	19 4	19 7	19 12	19 16	19 22	19 28
20	18 10	18 18	18 26	18 36	18 41	18 47	18 54	19 2	19 5	19 10	19 14	19 19	19 25
21	18 10	18 18	18 26	18 35	18 40	18 45	18 52	19 0	19 3	19 7	19 12	19 17	19 22
22	18 10	18 17	18 25	18 34	18 38	18 44	18 50	18 58	19 1	19 5	19 9	19 14	19 19
23	18 10	18 17	18 24	18 33	18 37	18 42	18 48	18 56	18 59	19 3	19 7	19 11	19 16
24	18 10	18 17	18 24	18 32	18 36	18 41	18 47	18 54	18 57	19 0	19 4	19 9	19 14
25	18 10	18 16	18 23	18 30	18 35	18 40	18 45	18 52	18 55	18 58	19 2	19 6	19 11
26	18 10	18 16	18 22	18 29	18 34	18 38	18 44	18 50	18 53	18 56	18 59	19 3	19 8
27	18 9	18 15	18 22	18 28	18 32	18 37	18 42	18 48	18 51	18 54	18 57	19 1	19 5
28	18 9	18 15	18 21	18 27	18 31	18 35	18 40	18 46	18 48	18 51	18 54	18 58	19 2
Mar. 1	18 9	18 14	18 20	18 26	18 30	18 34	18 38	18 44	18 46	18 49	18 52	18 55	18 59
2	18 9	18 14	18 19	18 25	18 28	18 32	18 37	18 42	18 44	18 47	18 49	18 53	18 56
3	18 9	18 14	18 18	18 24	18 27	18 31	18 35	18 40	18 42	18 44	18 47	18 50	18 53
4	18 8	18 13	18 18	18 23	18 26	18 29	18 33	18 38	18 40	18 42	18 44	18 47	18 50
5	18 8	18 12	18 17	18 22	18 25	18 28	18 31	18 36	18 37	18 40	18 42	18 44	18 47
6	18 8	18 12	18 16	18 21	18 23	18 26	18 30	18 33	18 35	18 37	18 39	18 42	18 44
7	18 8	18 12	18 15	18 20	18 22	18 25	18 28	18 31	18 33	18 35	18 37	18 39	18 41
8	18 8	18 11	18 14	18 18	18 20	18 23	18 26	18 29	18 30	18 32	18 34	18 36	18 38
9	18 7	18 10	18 14	18 17	18 19	18 21	18 24	18 27	18 28	18 30	18 31	18 33	18 35
10	18 7	18 10	18 13	18 16	18 18	18 20	18 22	18 25	18 26	18 27	18 29	18 30	18 32
11	18 7	18 9	18 12	18 15	18 16	18 18	18 20	18 23	18 24	18 25	18 26	18 28	18 29
12	18 6	18 9	18 11	18 14	18 15	18 17	18 18	18 20	18 21	18 22	18 24	18 25	18 26
13	18 6	18 8	18 10	18 13	18 14	18 15	18 17	18 18	18 19	18 20	18 21	18 22	18 23
14	18 6	18 8	18 9	18 11	18 12	18 14	18 15	18 16	18 17	18 18	18 18	18 19	18 20
15	18 6	18 7	18 9	18 10	18 11	18 12	18 13	18 14	18 15	18 15	18 16	18 16	18 17
16	18 5	18 6	18 8	18 9	18 10	18 10	18 11	18 12	18 12	18 13	18 13	18 14	18 14
17	18 5	18 6	18 7	18 8	18 8	18 9	18 9	18 10	18 10	18 10	18 11	18 11	18 11
18	18 5	18 5	18 6	18 7	18 7	18 7	18 7	18 8	18 8	18 8	18 8	18 8	18 8
19	18 4	18 5	18 5	18 5	18 5	18 6	18 5	18 5	18 5	18 5	18 5	18 5	18 5
20	18 4	18 4	18 4	18 4	18 4	18 4	18 4	18 3	18 3	18 3	18 3	18 2	18 2
21	18 4	18 4	18 3	18 3	18 3	18 2	18 2	18 1	18 1	18 0	18 0	18 0	17 59
22	18 4	18 3	18 2	18 2	18 1	18 1	18 0	17 59	17 58	17 58	17 57	17 57	17 56
23	18 3	18 2	18 2	18 0	18 0	17 59	17 58	17 57	17 56	17 55	17 55	17 54	17 53
24	18 3	18 2	18 1	17 59	17 58	17 57	17 56	17 54	17 54	17 53	17 52	17 51	17 50
25	18 3	18 1	18 0	17 58	17 57	17 56	17 54	17 52	17 52	17 50	17 50	17 48	17 47
26	18 2	18 1	17 59	17 57	17 56	17 54	17 52	17 50	17 49	17 48	17 47	17 46	17 44
27	18 2	18 0	17 58	17 56	17 54	17 52	17 50	17 48	17 47	17 46	17 44	17 43	17 41
28	18 2	18 0	17 57	17 54	17 53	17 51	17 48	17 46	17 44	17 43	17 41	17 40	17 38
29	18 2	17 59	17 56	17 53	17 51	17 49	17 47	17 44	17 42	17 41	17 39	17 37	17 35
30	18 1	17 58	17 56	17 52	17 50	17 48	17 45	17 41	17 40	17 38	17 36	17 34	17 32
31	18 1	17 58	17 55	17 51	17 48	17 46	17 43	17 39	17 38	17 36	17 34	17 31	17 29
Apr. 1	18 1	17 57	17 54	17 50	17 47	17 44	17 41	17 37	17 35	17 33	17 31	17 28	17 26
2	18 0	17 57	17 53	17 48	17 46	17 43	17 39	17 35	17 33	17 31	17 28	17 26	17 23

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET, MERIDIAN OF GREENWICH, 1919.

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For sunset in southern latitudes see page 720.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Feb. 16	6 18	6 9	5 59	5 49	5 43	5 36	5 28	5 18	5 14	5 9	5 4	4 58	4 51
17	6 18	6 9	6 0	5 50	5 44	5 37	5 29	5 20	5 16	5 11	5 6	5 0	4 54
18	6 18	6 9	6 0	5 50	5 45	5 38	5 31	5 22	5 18	5 13	5 8	5 3	4 56
19	6 18	6 9	6 1	5 51	5 46	5 40	5 32	5 24	5 20	5 15	5 10	5 5	4 59
20	6 17	6 10	6 1	5 52	5 47	5 41	5 34	5 25	5 22	5 17	5 13	5 7	5 2
21	6 17	6 10	6 2	5 53	5 48	5 42	5 35	5 27	5 23	5 19	5 15	5 10	5 4
22	6 17	6 10	6 2	5 53	5 48	5 43	5 36	5 29	5 25	5 21	5 17	5 12	5 7
23	6 17	6 10	6 3	5 54	5 49	5 44	5 38	5 30	5 27	5 23	5 19	5 14	5 9
24	6 17	6 10	6 3	5 55	5 50	5 45	5 39	5 32	5 29	5 25	5 21	5 17	5 12
25	6 17	6 10	6 3	5 56	5 51	5 46	5 40	5 34	5 31	5 27	5 23	5 19	5 14
26	6 17	6 10	6 4	5 56	5 52	5 47	5 42	5 35	5 32	5 29	5 26	5 22	5 17
27	6 16	6 10	6 4	5 57	5 53	5 49	5 43	5 37	5 34	5 31	5 28	5 24	5 20
28	6 16	6 10	6 4	5 58	5 54	5 50	5 44	5 39	5 36	5 33	5 30	5 26	5 22
Mar. 1	6 16	6 10	6 5	5 58	5 55	5 51	5 46	5 40	5 38	5 35	5 32	5 28	5 25
2	6 16	6 10	6 5	5 59	5 56	5 52	5 47	5 42	5 40	5 37	5 34	5 31	5 27
3	6 16	6 11	6 6	6 0	5 56	5 53	5 49	5 44	5 42	5 39	5 36	5 33	5 30
4	6 15	6 11	6 6	6 0	5 57	5 54	5 50	5 45	5 43	5 41	5 38	5 35	5 32
5	6 15	6 11	6 6	6 1	5 58	5 55	5 51	5 47	5 45	5 43	5 40	5 38	5 35
6	6 15	6 11	6 7	6 2	5 59	5 56	5 53	5 49	5 47	5 45	5 43	5 40	5 37
7	6 15	6 11	6 7	6 3	6 0	5 57	5 54	5 50	5 49	5 47	5 45	5 42	5 40
8	6 14	6 11	6 7	6 3	6 1	5 58	5 55	5 52	5 50	5 49	5 47	5 45	5 42
9	6 14	6 11	6 8	6 4	6 2	5 59	5 57	5 54	5 52	5 51	5 49	5 47	5 45
10	6 14	6 11	6 8	6 4	6 2	6 0	5 58	5 55	5 54	5 52	5 51	5 49	5 47
11	6 14	6 11	6 8	6 5	6 3	6 1	5 59	5 57	5 56	5 54	5 53	5 51	5 50
12	6 13	6 11	6 8	6 6	6 4	6 2	6 1	5 58	5 57	5 56	5 55	5 54	5 52
13	6 13	6 11	6 9	6 6	6 5	6 4	6 2	6 0	5 59	5 58	5 57	5 56	5 55
14	6 13	6 11	6 9	6 7	6 6	6 5	6 3	6 2	6 1	6 0	5 59	5 58	5 57
15	6 13	6 11	6 10	6 8	6 7	6 6	6 5	6 3	6 3	6 2	6 1	6 1	6 0
16	6 12	6 11	6 10	6 8	6 8	6 7	6 6	6 5	6 4	6 4	6 3	6 3	6 2
17	6 12	6 11	6 10	6 9	6 8	6 8	6 7	6 6	6 6	6 6	6 5	6 5	6 4
18	6 12	6 11	6 10	6 10	6 9	6 9	6 8	6 8	6 8	6 8	6 8	6 7	6 7
19	6 12	6 11	6 11	6 10	6 10	6 10	6 10	6 10	6 10	6 10	6 10	6 10	6 9
20	6 11	6 11	6 11	6 11	6 11	6 11	6 11	6 11	6 11	6 12	6 12	6 12	6 12
21	6 11	6 11	6 11	6 11	6 12	6 12	6 12	6 13	6 13	6 13	6 14	6 14	6 14
22	6 10	6 11	6 11	6 12	6 12	6 13	6 14	6 14	6 15	6 15	6 16	6 16	6 17
23	6 10	6 11	6 12	6 13	6 13	6 14	6 15	6 16	6 16	6 17	6 18	6 18	6 19
24	6 10	6 11	6 12	6 13	6 14	6 15	6 16	6 18	6 18	6 19	6 20	6 21	6 22
25	6 10	6 11	6 12	6 14	6 15	6 16	6 17	6 19	6 20	6 21	6 22	6 23	6 24
26	6 9	6 11	6 12	6 14	6 16	6 17	6 19	6 21	6 22	6 23	6 24	6 25	6 26
27	6 9	6 11	6 13	6 15	6 16	6 18	6 20	6 22	6 23	6 25	6 26	6 27	6 29
28	6 9	6 11	6 13	6 16	6 17	6 19	6 21	6 24	6 25	6 26	6 28	6 30	6 31
29	6 8	6 11	6 13	6 16	6 18	6 20	6 22	6 25	6 27	6 28	6 30	6 32	6 34
30	6 8	6 11	6 14	6 17	6 19	6 21	6 24	6 27	6 28	6 30	6 32	6 34	6 36
31	6 8	6 11	6 14	6 18	6 20	6 22	6 25	6 28	6 30	6 32	6 34	6 36	6 39
Apr. 1	6 8	6 11	6 14	6 18	6 20	6 23	6 26	6 30	6 32	6 34	6 36	6 38	6 41
2	6 7	6 10	6 14	6 19	6 21	6 24	6 28	6 32	6 34	6 36	6 38	6 41	6 44
3	6 7	6 10	6 15	6 19	6 22	6 25	6 29	6 33	6 35	6 38	6 40	6 43	6 48

TABLE VIII.

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 720.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr. 1	18 1	17 57	17 54	17 50	17 47	17 44	17 41	17 37	17 35	17 33	17 31	17 28	17 26
2	18 0	17 57	17 53	17 48	17 46	17 43	17 39	17 35	17 33	17 31	17 28	17 26	17 23
3	18 0	17 56	17 52	17 47	17 44	17 41	17 37	17 33	17 31	17 28	17 26	17 23	17 20
4	18 0	17 56	17 51	17 46	17 43	17 40	17 35	17 30	17 28	17 26	17 23	17 20	17 17
5	17 59	17 55	17 50	17 45	17 42	17 38	17 34	17 28	17 26	17 23	17 20	17 17	17 14
6	17 59	17 54	17 50	17 44	17 40	17 36	17 32	17 26	17 24	17 21	17 18	17 14	17 10
7	17 59	17 54	17 49	17 42	17 39	17 35	17 30	17 24	17 22	17 18	17 15	17 12	17 7
8	17 58	17 53	17 48	17 41	17 38	17 33	17 28	17 22	17 19	17 16	17 13	17 9	17 4
9	17 58	17 53	17 47	17 41	17 36	17 32	17 26	17 20	17 17	17 14	17 10	17 6	17 2
10	17 58	17 52	17 46	17 39	17 35	17 30	17 24	17 18	17 15	17 11	17 8	17 3	16 59
11	17 58	17 52	17 45	17 38	17 34	17 29	17 23	17 16	17 12	17 9	17 5	17 1	16 56
12	17 57	17 51	17 45	17 37	17 32	17 27	17 21	17 14	17 10	17 7	17 2	16 58	16 53
13	17 57	17 51	17 44	17 36	17 31	17 26	17 19	17 12	17 8	17 4	17 0	16 55	16 50
14	17 57	17 50	17 43	17 34	17 30	17 24	17 17	17 10	17 6	17 2	16 57	16 52	16 47
15	17 57	17 50	17 42	17 33	17 28	17 22	17 16	17 8	17 4	17 0	16 55	16 50	16 44
16	17 56	17 49	17 41	17 32	17 27	17 21	17 14	17 5	17 1	16 57	16 52	16 47	16 41
17	17 56	17 49	17 41	17 31	17 26	17 20	17 12	17 3	16 59	16 55	16 50	16 44	16 38
18	17 56	17 48	17 40	17 30	17 24	17 18	17 10	17 1	16 57	16 52	16 47	16 42	16 35
19	17 56	17 48	17 39	17 29	17 23	17 16	17 9	16 59	16 55	16 50	16 45	16 39	16 32
20	17 55	17 47	17 38	17 28	17 22	17 15	17 7	16 57	16 53	16 48	16 42	16 36	16 29
21	17 55	17 47	17 38	17 27	17 21	17 14	17 5	16 55	16 51	16 46	16 40	16 34	16 26
22	17 55	17 46	17 37	17 26	17 20	17 12	17 4	16 53	16 49	16 43	16 37	16 31	16 23
23	17 55	17 46	17 36	17 25	17 18	17 11	17 2	16 51	16 46	16 41	16 35	16 28	16 20
24	17 55	17 45	17 35	17 24	17 17	17 10	17 0	16 50	16 44	16 39	16 33	16 26	16 18
25	17 54	17 45	17 35	17 23	17 16	17 8	16 59	16 48	16 42	16 37	16 30	16 23	16 15
26	17 54	17 45	17 34	17 22	17 15	17 7	16 57	16 46	16 40	16 34	16 28	16 20	16 12
27	17 54	17 44	17 33	17 21	17 14	17 5	16 56	16 44	16 38	16 32	16 25	16 18	16 9
28	17 54	17 44	17 33	17 20	17 13	17 4	16 54	16 42	16 36	16 30	16 23	16 15	16 6
29	17 54	17 43	17 32	17 19	17 11	17 3	16 52	16 40	16 34	16 28	16 21	16 13	16 4
30	17 54	17 43	17 32	17 18	17 10	17 2	16 51	16 38	16 32	16 26	16 18	16 10	16 1
May 1	17 54	17 43	17 31	17 17	17 9	17 0	16 50	16 37	16 30	16 24	16 16	16 8	15 58
2	17 54	17 42	17 30	17 16	17 8	16 59	16 48	16 35	16 29	16 22	16 14	16 5	15 55
3	17 53	17 42	17 30	17 16	17 7	16 58	16 46	16 33	16 27	16 20	16 12	16 3	15 53
4	17 53	17 42	17 29	17 15	17 6	16 57	16 45	16 31	16 25	16 18	16 10	16 0	15 50
5	17 53	17 41	17 28	17 14	17 5	16 55	16 44	16 30	16 23	16 16	16 7	15 58	15 47
6	17 53	17 41	17 28	17 13	17 4	16 54	16 42	16 28	16 21	16 14	16 5	15 56	15 45
7	17 53	17 41	17 28	17 12	17 3	16 53	16 41	16 26	16 19	16 12	16 3	15 53	15 42
8	17 53	17 40	17 27	17 11	17 2	16 52	16 40	16 25	16 18	16 10	16 1	15 51	15 40
9	17 53	17 40	17 26	17 11	17 1	16 51	16 38	16 23	16 16	16 8	15 59	15 49	15 37
10	17 53	17 40	17 26	17 10	17 0	16 50	16 37	16 22	16 14	16 6	15 57	15 46	15 34
11	17 53	17 40	17 26	17 9	17 0	16 49	16 36	16 20	16 12	16 4	15 55	15 44	15 32
12	17 53	17 40	17 26	17 9	16 59	16 48	16 34	16 18	16 11	16 2	15 53	15 42	15 29
13	17 53	17 39	17 25	17 8	16 58	16 47	16 33	16 17	16 9	16 1	15 51	15 40	15 27
14	17 53	17 39	17 24	17 7	16 57	16 46	16 32	16 16	16 8	15 59	15 49	15 38	15 25
15	17 53	17 39	17 24	17 7	16 56	16 45	16 31	16 14	16 6	15 57	15 47	15 36	15 22
16	17 53	17 39	17 24	17 6	16 56	16 44	16 30	16 13	16 5	15 56	15 45	15 34	15 20
17	17 53	17 38	17 23	17 5	16 55	16 43	16 29	16 11	16 3	15 54	15 44	15 32	15 18

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 720.

Lat. Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr. 2	6 7	6 10	6 14	6 19	6 21	6 24	6 28	6 32	6 34	6 36	6 38	6 41	6 44
3	6 7	6 10	6 15	6 19	6 22	6 25	6 29	6 33	6 35	6 38	6 40	6 43	6 46
4	6 7	6 10	6 15	6 20	6 23	6 26	6 30	6 35	6 37	6 40	6 42	6 45	6 48
5	6 6	6 10	6 15	6 20	6 24	6 27	6 31	6 36	6 39	6 41	6 44	6 47	6 51
6	6 6	6 10	6 15	6 21	6 24	6 28	6 33	6 38	6 40	6 43	6 46	6 50	6 53
7	6 6	6 10	6 16	6 22	6 25	6 29	6 34	6 39	6 42	6 45	6 48	6 52	6 56
8	6 6	6 10	6 16	6 22	6 26	6 30	6 35	6 41	6 44	6 47	6 50	6 54	6 58
9	6 5	6 10	6 16	6 23	6 27	6 31	6 36	6 43	6 46	6 49	6 52	6 56	7 1
10	6 5	6 10	6 16	6 24	6 28	6 32	6 38	6 44	6 47	6 50	6 54	6 58	7 3
11	6 5	6 10	6 17	6 24	6 28	6 33	6 39	6 46	6 49	6 52	6 56	7 1	7 6
12	6 4	6 10	6 17	6 25	6 29	6 34	6 40	6 47	6 51	6 54	6 58	7 3	7 8
13	6 4	6 10	6 17	6 25	6 30	6 35	6 42	6 49	6 52	6 56	7 0	7 5	7 10
14	6 4	6 10	6 18	6 26	6 31	6 36	6 43	6 50	6 54	6 58	7 2	7 7	7 13
15	6 4	6 10	6 18	6 26	6 32	6 37	6 44	6 52	6 56	7 0	7 4	7 9	7 15
16	6 3	6 10	6 18	6 27	6 32	6 38	6 45	6 54	6 58	7 2	7 6	7 12	7 18
17	6 3	6 10	6 18	6 28	6 33	6 39	6 46	6 55	6 59	7 4	7 8	7 14	7 20
18	6 3	6 10	6 19	6 28	6 34	6 40	6 48	6 57	7 1	7 5	7 10	7 16	7 23
19	6 3	6 11	6 19	6 29	6 35	6 41	6 49	6 58	7 3	7 7	7 12	7 18	7 25
20	6 2	6 11	6 19	6 30	6 36	6 42	6 50	7 0	7 4	7 9	7 14	7 21	7 28
21	6 2	6 11	6 20	6 30	6 36	6 43	6 52	7 1	7 6	7 11	7 17	7 23	7 30
22	6 2	6 11	6 20	6 31	6 37	6 44	6 53	7 3	7 8	7 13	7 19	7 25	7 33
23	6 2	6 11	6 20	6 31	6 38	6 45	6 54	7 4	7 9	7 15	7 21	7 27	7 35
24	6 2	6 11	6 21	6 32	6 39	6 46	6 55	7 6	7 11	7 17	7 23	7 30	7 38
25	6 2	6 11	6 21	6 33	6 40	6 47	6 57	7 8	7 13	7 18	7 25	7 32	7 40
26	6 1	6 11	6 21	6 33	6 40	6 48	6 58	7 9	7 14	7 20	7 27	7 34	7 42
27	6 1	6 11	6 22	6 34	6 41	6 49	6 59	7 11	7 16	7 22	7 29	7 36	7 45
28	6 1	6 11	6 22	6 35	6 42	6 50	7 0	7 12	7 18	7 24	7 31	7 39	7 47
29	6 1	6 11	6 22	6 35	6 43	6 51	7 2	7 14	7 19	7 26	7 33	7 41	7 50
30	6 1	6 11	6 23	6 36	6 44	6 52	7 3	7 15	7 21	7 28	7 35	7 43	7 52
May 1	6 1	6 12	6 23	6 37	6 44	6 53	7 4	7 17	7 23	7 30	7 37	7 45	7 55
2	6 0	6 12	6 23	6 37	6 45	6 54	7 5	7 18	7 24	7 31	7 39	7 48	7 57
3	6 0	6 12	6 24	6 38	6 46	6 55	7 7	7 20	7 26	7 33	7 41	7 50	8 0
4	6 0	6 12	6 24	6 38	6 47	6 56	7 8	7 21	7 28	7 35	7 43	7 52	8 2
5	6 0	6 12	6 25	6 39	6 48	6 57	7 9	7 23	7 30	7 37	7 45	7 54	8 5
6	6 0	6 12	6 25	6 40	6 49	6 58	7 10	7 24	7 31	7 39	7 47	7 56	8 7
7	6 0	6 12	6 25	6 40	6 49	6 59	7 12	7 26	7 33	7 40	7 49	7 58	8 10
8	6 0	6 12	6 26	6 41	6 50	7 0	7 13	7 28	7 34	7 42	7 51	8 1	8 12
9	6 0	6 12	6 26	6 42	6 51	7 1	7 14	7 29	7 36	7 44	7 53	8 3	8 15
10	6 0	6 13	6 26	6 42	6 52	7 2	7 15	7 30	7 38	7 46	7 55	8 5	8 17
11	6 0	6 13	6 27	6 43	6 53	7 3	7 16	7 32	7 39	7 48	7 57	8 7	8 20
12	6 0	6 13	6 27	6 44	6 53	7 4	7 17	7 33	7 41	7 49	7 59	8 9	8 22
13	6 0	6 13	6 28	6 44	6 54	7 5	7 19	7 35	7 42	7 51	8 1	8 12	8 24
14	6 0	6 13	6 28	6 45	6 55	7 6	7 20	7 36	7 44	7 53	8 2	8 14	8 27
15	6 0	6 14	6 28	6 46	6 56	7 7	7 21	7 38	7 46	7 54	8 4	8 16	8 29
16	6 0	6 14	6 29	6 46	6 56	7 8	7 22	7 39	7 47	7 56	8 6	8 18	8 31
17	6 0	6 14	6 29	6 47	6 57	7 9	7 23	7 40	7 49	7 58	8 8	8 20	8 34
18	6 0	6 14	6 30	6 48	6 58	7 10	7 24	7 42	7 50	7 59	8 10	8 22	8 38

TABLE VIII.

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 720.

Lat. Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
May 17	17 53	17 38	17 23	17 5	16 55	16 43	16 29	16 11	16 3	15 54	15 44	15 32	15 18
18	17 53	17 38	17 23	17 5	16 54	16 42	16 28	16 10	16 2	15 52	15 42	15 30	15 16
19	17 53	17 38	17 22	17 4	16 54	16 41	16 27	16 9	16 0	15 51	15 40	15 28	15 13
20	17 53	17 38	17 22	17 4	16 53	16 40	16 26	16 8	15 59	15 49	15 38	15 26	15 11
21	17 53	17 38	17 22	17 3	16 52	16 40	16 25	16 6	15 58	15 48	15 37	15 24	15 9
22	17 53	17 38	17 22	17 3	16 52	16 39	16 24	16 5	15 56	15 46	15 35	15 22	15 7
23	17 53	17 38	17 21	17 2	16 51	16 38	16 23	16 4	15 55	15 45	15 34	15 20	15 5
24	17 53	17 38	17 21	17 2	16 50	16 38	16 22	16 3	15 54	15 44	15 32	15 19	15 3
25	17 53	17 38	17 21	17 1	16 50	16 37	16 21	16 2	15 53	15 42	15 31	15 17	15 1
26	17 53	17 38	17 21	17 1	16 50	16 36	16 20	16 1	15 52	15 41	15 29	15 15	14 59
27	17 53	17 38	17 20	17 1	16 49	16 36	16 20	16 0	15 51	15 40	15 28	15 14	14 57
28	17 54	17 38	17 20	17 0	16 49	16 35	16 19	15 59	15 50	15 39	15 27	15 12	14 56
29	17 54	17 38	17 20	17 0	16 48	16 35	16 18	15 58	15 49	15 38	15 25	15 11	14 54
30	17 54	17 38	17 20	17 0	16 48	16 34	16 18	15 57	15 48	15 37	15 24	15 10	14 52
31	17 54	17 38	17 20	16 59	16 47	16 34	16 17	15 56	15 47	15 36	15 23	15 8	14 50
June 1	17 54	17 38	17 20	16 59	16 47	16 33	16 16	15 56	15 46	15 35	15 22	15 7	14 49
2	17 54	17 38	17 20	16 59	16 47	16 33	16 16	15 55	15 45	15 34	15 21	15 6	14 48
3	17 54	17 38	17 20	16 59	16 46	16 32	16 16	15 54	15 44	15 33	15 20	15 5	14 46
4	17 54	17 38	17 20	16 59	16 46	16 32	16 15	15 54	15 44	15 32	15 19	15 4	14 45
5	17 55	17 38	17 20	16 58	16 46	16 32	16 15	15 53	15 43	15 31	15 18	15 3	14 44
6	17 55	17 38	17 20	16 58	16 46	16 31	16 14	15 53	15 42	15 31	15 17	15 2	14 43
7	17 55	17 38	17 20	16 58	16 46	16 31	16 14	15 52	15 42	15 30	15 16	15 1	14 42
8	17 55	17 38	17 20	16 58	16 46	16 31	16 14	15 52	15 41	15 30	15 16	15 0	14 41
9	17 55	17 38	17 20	16 58	16 45	16 31	16 13	15 51	15 41	15 29	15 15	14 59	14 40
10	17 56	17 38	17 20	16 58	16 45	16 31	16 13	15 51	15 40	15 28	15 15	14 58	14 39
11	17 56	17 38	17 20	16 58	16 45	16 30	16 13	15 51	15 40	15 28	15 14	14 58	14 38
12	17 56	17 39	17 20	16 58	16 45	16 30	16 13	15 50	15 40	15 28	15 14	14 57	14 37
13	17 56	17 39	17 20	16 58	16 45	16 30	16 12	15 50	15 40	15 27	15 13	14 57	14 37
14	17 56	17 39	17 20	16 58	16 45	16 30	16 12	15 50	15 39	15 27	15 13	14 56	14 36
15	17 56	17 39	17 20	16 58	16 45	16 30	16 12	15 50	15 39	15 27	15 13	14 56	14 36
16	17 57	17 39	17 20	16 58	16 45	16 30	16 12	15 50	15 39	15 27	15 13	14 56	14 36
17	17 57	17 40	17 20	16 59	16 45	16 30	16 12	15 50	15 39	15 27	15 12	14 56	14 35
18	17 57	17 40	17 21	16 59	16 46	16 30	16 13	15 50	15 39	15 27	15 12	14 56	14 35
19	17 57	17 40	17 21	16 59	16 46	16 31	16 13	15 50	15 39	15 27	15 12	14 56	14 35
20	17 58	17 40	17 21	16 59	16 46	16 31	16 13	15 50	15 39	15 27	15 13	14 56	14 35
21	17 58	17 40	17 21	16 59	16 46	16 31	16 13	15 50	15 39	15 27	15 13	14 56	14 35
22	17 58	17 40	17 22	16 59	16 46	16 31	16 13	15 51	15 40	15 27	15 13	14 56	14 36
23	17 58	17 41	17 22	17 0	16 46	16 31	16 13	15 51	15 40	15 28	15 13	14 56	14 36
24	17 58	17 41	17 22	17 0	16 47	16 32	16 14	15 51	15 40	15 28	15 14	14 57	14 36
25	17 59	17 41	17 22	17 0	16 47	16 32	16 14	15 52	15 41	15 28	15 14	14 57	14 37
26	17 59	17 41	17 22	17 0	16 48	16 32	16 14	15 52	15 41	15 29	15 15	14 58	14 38
27	17 59	17 42	17 23	17 1	16 48	16 33	16 15	15 52	15 42	15 29	15 15	14 58	14 38
28	17 59	17 42	17 23	17 1	16 48	16 33	16 15	15 53	15 42	15 30	15 16	14 59	14 39
29	18 0	17 42	17 23	17 1	16 48	16 34	16 16	15 53	15 43	15 30	15 16	15 0	14 40
30	18 0	17 42	17 24	17 2	16 49	16 34	16 16	15 54	15 43	15 31	15 17	15 1	14 41
July 1	18 0	17 43	17 24	17 2	16 49	16 34	16 17	15 55	15 44	15 32	15 18	15 2	14 42
2	18 0	17 43	17 24	17 2	16 50	16 35	16 17	15 55	15 45	15 33	15 19	15 3	14 43

OCAL ASTRONOMICAL MEAN TIME OF SUNSET, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of nutes the station is west of the standard meridian, or decrease the local time by the number minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 720.

Lat. te.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
y 18	6 0	6 14	6 30	6 48	6 58	7 10	7 24	7 42	7 50	7 59	8 10	8 22	8 36
19	6 0	6 14	6 30	6 48	6 59	7 11	7 25	7 43	7 52	8 1	8 12	8 24	8 38
20	6 0	6 15	6 30	6 49	7 0	7 12	7 26	7 44	7 53	8 3	8 14	8 26	8 40
21	6 0	6 15	6 31	6 49	7 0	7 13	7 28	7 46	7 55	8 4	8 15	8 28	8 43
22	6 0	6 15	6 31	6 50	7 1	7 14	7 29	7 47	7 56	8 6	8 17	8 30	8 45
23	6 0	6 15	6 32	6 51	7 2	7 15	7 30	7 48	7 57	8 7	8 19	8 32	8 47
24	6 0	6 16	6 32	6 51	7 2	7 15	7 31	7 50	7 59	8 9	8 20	8 34	8 49
25	6 0	6 16	6 32	6 52	7 3	7 16	7 32	7 51	8 0	8 10	8 22	8 36	8 52
26	6 0	6 16	6 33	6 52	7 4	7 17	7 33	7 52	8 2	8 12	8 24	8 37	8 54
27	6 0	6 16	6 33	6 53	7 5	7 18	7 34	7 53	8 3	8 13	8 25	8 39	8 56
28	6 1	6 17	6 34	6 54	7 5	7 19	7 35	7 55	8 4	8 15	8 27	8 41	8 58
29	6 1	6 17	6 34	6 54	7 6	7 20	7 36	7 56	8 5	8 16	8 28	8 43	9 0
30	6 1	6 17	6 34	6 55	7 7	7 20	7 36	7 57	8 6	8 17	8 30	8 44	9 2
31	6 1	6 17	6 35	6 55	7 7	7 21	7 37	7 58	8 8	8 19	8 31	8 46	9 4
ne 1	6 1	6 18	6 35	6 56	7 8	7 22	7 38	7 59	8 9	8 20	8 33	8 48	9 5
2	6 1	6 18	6 36	6 56	7 8	7 22	7 39	8 0	8 10	8 21	8 34	8 49	9 7
3	6 1	6 18	6 36	6 56	7 9	7 23	7 40	8 1	8 11	8 22	8 35	8 50	9 9
4	6 2	6 18	6 36	6 57	7 10	7 24	7 41	8 2	8 12	8 24	8 37	8 52	9 10
5	6 2	6 18	6 37	6 58	7 10	7 24	7 42	8 3	8 13	8 25	8 38	8 53	9 12
6	6 2	6 19	6 37	6 58	7 11	7 25	7 42	8 4	8 14	8 26	8 39	8 55	9 14
7	6 2	6 19	6 38	6 59	7 11	7 26	7 43	8 5	8 15	8 27	8 40	8 56	9 15
8	6 2	6 20	6 38	6 59	7 12	7 26	7 44	8 6	8 16	8 28	8 41	8 57	9 16
9	6 2	6 20	6 38	7 0	7 12	7 27	7 44	8 6	8 17	8 29	8 42	8 58	9 18
10	6 3	6 20	6 38	7 0	7 13	7 28	7 46	8 7	8 18	8 30	8 43	8 59	9 19
11	6 3	6 20	6 39	7 1	7 13	7 28	7 46	8 8	8 18	8 30	8 44	9 1	9 20
12	6 3	6 20	6 39	7 1	7 14	7 29	7 46	8 8	8 19	8 31	8 45	9 2	9 21
13	6 3	6 21	6 40	7 1	7 14	7 29	7 47	8 9	8 20	8 32	8 46	9 2	9 22
14	6 4	6 21	6 40	7 2	7 15	7 30	7 47	8 10	8 20	8 33	8 47	9 3	9 23
15	6 4	6 21	6 40	7 2	7 15	7 30	7 48	8 10	8 21	8 33	8 47	9 4	9 24
16	6 4	6 22	6 40	7 2	7 15	7 30	7 48	8 11	8 22	8 34	8 48	9 5	9 25
17	6 4	6 22	6 41	7 3	7 16	7 31	7 49	8 11	8 22	8 34	8 49	9 5	9 26
18	6 4	6 22	6 41	7 3	7 16	7 31	7 49	8 12	8 22	8 35	8 49	9 6	9 26
19	6 5	6 22	6 41	7 3	7 16	7 31	7 49	8 12	8 23	8 35	8 50	9 6	9 27
20	6 5	6 22	6 41	7 4	7 17	7 32	7 50	8 12	8 23	8 36	8 50	9 7	9 27
21	6 5	6 23	6 42	7 4	7 17	7 32	7 50	8 12	8 24	8 36	8 50	9 7	9 28
22	6 5	6 23	6 42	7 4	7 17	7 32	7 50	8 13	8 24	8 36	8 50	9 7	9 28
23	6 5	6 23	6 42	7 4	7 17	7 32	7 50	8 13	8 24	8 36	8 50	9 7	9 28
24	6 6	6 23	6 42	7 4	7 17	7 32	7 50	8 13	8 24	8 36	8 51	9 7	9 28
25	6 6	6 24	6 42	7 4	7 18	7 32	7 50	8 13	8 24	8 36	8 51	9 7	9 28
26	6 6	6 24	6 43	7 5	7 18	7 33	7 51	8 13	8 24	8 36	8 51	9 7	9 28
27	6 6	6 24	6 43	7 5	7 18	7 33	7 51	8 13	8 24	8 36	8 50	9 7	9 28
28	6 6	6 24	6 43	7 5	7 18	7 33	7 51	8 13	8 24	8 36	8 50	9 7	9 27
29	6 7	6 24	6 43	7 5	7 18	7 33	7 50	8 13	8 24	8 36	8 50	9 7	9 27
30	6 7	6 24	6 43	7 5	7 18	7 33	7 50	8 13	8 24	8 36	8 50	9 6	9 26
y 1	6 7	6 24	6 43	7 5	7 18	7 33	7 50	8 13	8 23	8 35	8 49	9 6	9 26
2	6 7	6 25	6 43	7 5	7 18	7 33	7 50	8 12	8 23	8 35	8 49	9 5	9 25
3	6 8	6 25	6 43	7 5	7 18	7 32	7 50	8 12	8 23	8 35	8 48	9 5	9 24

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 720.

Lat. / Date.		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July	1	18 0	17 43	17 24	17 2	16 49	16 34	16 17	15 55	15 44	15 32	15 18	15 2	14 42
	2	18 0	17 43	17 24	17 2	16 50	16 35	16 17	15 55	15 45	15 33	15 19	15 3	14 43
	3	18 0	17 43	17 25	17 3	16 50	16 36	16 18	15 56	15 45	15 34	15 20	15 4	14 44
	4	18 0	17 43	17 25	17 3	16 51	16 36	16 19	15 57	15 46	15 34	15 21	15 5	14 45
	5	18 1	17 44	17 25	17 4	16 51	16 37	16 19	15 58	15 47	15 35	15 22	15 6	14 46
	6	18 1	17 44	17 26	17 4	16 52	16 37	16 20	15 58	15 48	15 36	15 23	15 7	14 48
	7	18 1	17 44	17 26	17 5	16 52	16 38	16 21	15 59	15 49	15 37	15 24	15 8	14 49
	8	18 1	17 44	17 26	17 5	16 53	16 38	16 21	16 0	15 50	15 38	15 25	15 10	14 51
	9	18 1	17 45	17 27	17 6	16 53	16 39	16 22	16 1	15 51	15 39	15 26	15 11	14 52
	10	18 2	17 45	17 27	17 6	16 54	16 40	16 23	16 2	15 52	15 40	15 27	15 12	14 54
	11	18 2	17 45	17 27	17 7	16 54	16 40	16 24	16 3	15 53	15 42	15 29	15 14	14 56
	12	18 2	17 45	17 28	17 7	16 55	16 41	16 24	16 4	15 54	15 43	15 30	15 15	14 57
	13	18 2	17 46	17 28	17 8	16 56	16 42	16 25	16 5	15 55	15 44	15 32	15 17	14 59
	14	18 2	17 46	17 28	17 8	16 56	16 43	16 26	16 6	15 56	15 45	15 33	15 18	15 1
	15	18 2	17 46	17 29	17 9	16 57	16 43	16 27	16 7	15 58	15 47	15 34	15 20	15 3
	16	18 2	17 46	17 29	17 9	16 58	16 44	16 28	16 8	15 59	15 48	15 36	15 22	15 5
	17	18 2	17 47	17 30	17 10	16 58	16 45	16 29	16 9	16 0	15 49	15 37	15 24	15 7
	18	18 2	17 47	17 30	17 10	16 59	16 46	16 30	16 10	16 1	15 51	15 39	15 25	15 9
	19	18 2	17 47	17 30	17 11	17 0	16 46	16 31	16 12	16 2	15 52	15 41	15 27	15 11
	20	18 3	17 47	17 31	17 12	17 0	16 47	16 32	16 13	16 4	15 54	15 42	15 29	15 13
	21	18 3	17 48	17 31	17 12	17 1	16 48	16 33	16 14	16 5	15 55	15 44	15 31	15 15
	22	18 3	17 48	17 32	17 13	17 2	16 49	16 34	16 15	16 7	15 57	15 45	15 33	15 17
	23	18 3	17 48	17 32	17 13	17 2	16 50	16 35	16 17	16 8	15 58	15 47	15 34	15 20
	24	18 3	17 48	17 32	17 14	17 3	16 51	16 36	16 18	16 9	16 0	15 49	15 36	15 22
	25	18 3	17 48	17 33	17 14	17 4	16 52	16 37	16 19	16 11	16 1	15 51	15 38	15 24
	26	18 3	17 48	17 33	17 15	17 5	16 52	16 38	16 20	16 12	16 3	15 52	15 40	15 26
	27	18 3	17 49	17 33	17 16	17 5	16 53	16 39	16 22	16 14	16 5	15 54	15 42	15 28
	28	18 3	17 49	17 34	17 16	17 6	16 54	16 40	16 23	16 15	16 6	15 56	15 44	15 31
	29	18 3	17 49	17 34	17 17	17 7	16 55	16 42	16 25	16 17	16 8	15 58	15 46	15 33
	30	18 3	17 49	17 34	17 18	17 8	16 56	16 43	16 26	16 18	16 10	16 0	15 48	15 35
	31	18 3	17 49	17 35	17 18	17 8	16 57	16 44	16 27	16 20	16 11	16 1	15 51	15 38
Aug.	1	18 3	17 50	17 35	17 19	17 9	16 58	16 45	16 29	16 21	16 13	16 3	15 53	15 40
	2	18 3	17 50	17 36	17 19	17 10	16 59	16 46	16 30	16 23	16 15	16 5	15 55	15 42
	3	18 3	17 50	17 36	17 20	17 10	17 0	16 47	16 32	16 24	16 16	16 7	15 57	15 45
	4	18 2	17 50	17 36	17 20	17 11	17 1	16 48	16 33	16 26	16 18	16 9	15 59	15 47
	5	18 2	17 50	17 36	17 21	17 12	17 2	16 50	16 34	16 28	16 20	16 11	16 1	15 50
	6	18 2	17 50	17 37	17 22	17 13	17 3	16 51	16 36	16 29	16 21	16 13	16 3	15 52
	7	18 2	17 50	17 37	17 22	17 14	17 4	16 52	16 37	16 31	16 23	16 15	16 5	15 54
	8	18 2	17 50	17 38	17 23	17 14	17 5	16 53	16 39	16 32	16 25	16 17	16 8	15 57
	9	18 2	17 50	17 38	17 24	17 15	17 6	16 54	16 40	16 34	16 27	16 19	16 10	15 59
	10	18 2	17 50	17 38	17 24	17 16	17 6	16 55	16 42	16 36	16 28	16 21	16 12	16 2
	11	18 2	17 51	17 38	17 25	17 17	17 7	16 57	16 43	16 37	16 30	16 23	16 14	16 4
	12	18 2	17 51	17 39	17 25	17 17	17 8	16 58	16 45	16 39	16 32	16 24	16 16	16 6
	13	18 1	17 51	17 39	17 26	17 18	17 9	16 59	16 46	16 40	16 34	16 26	16 18	16 9
	14	18 1	17 51	17 40	17 26	17 19	17 10	17 0	16 48	16 42	16 36	16 28	16 20	16 11
	15	18 1	17 51	17 40	17 27	17 20	17 11	17 1	16 49	16 44	16 37	16 30	16 22	16 14
	16	18 1	17 51	17 40	17 28	17 20	17 12	17 2	16 51	16 45	16 39	16 32	16 25	16 16

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, write P. M. after the astronomical time.

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For sunset in southern latitudes see page 720.

Lat. / Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July 2	6 7	6 25	6 43	7 5	7 18	7 33	7 50	8 12	8 23	8 35	8 49	9 5	9 25
3	6 8	6 25	6 43	7 5	7 18	7 32	7 50	8 12	8 23	8 35	8 48	9 5	9 24
4	6 8	6 25	6 43	7 5	7 18	7 32	7 50	8 12	8 22	8 34	8 48	9 4	9 24
5	6 8	6 25	6 43	7 5	7 18	7 32	7 50	8 11	8 22	8 34	8 47	9 3	9 23
6	6 8	6 25	6 43	7 5	7 17	7 32	7 49	8 11	8 21	8 33	8 47	9 2	9 22
7	6 8	6 25	6 43	7 5	7 17	7 32	7 49	8 10	8 21	8 32	8 46	9 1	9 20
8	6 8	6 25	6 43	7 4	7 17	7 31	7 48	8 10	8 20	8 32	8 45	9 0	9 19
9	6 8	6 25	6 43	7 4	7 17	7 31	7 48	8 9	8 19	8 31	8 44	8 59	9 18
10	6 9	6 25	6 43	7 4	7 16	7 31	7 48	8 9	8 19	8 30	8 43	8 58	9 17
11	6 9	6 25	6 43	7 4	7 16	7 30	7 47	8 8	8 18	8 29	8 42	8 57	9 16
12	6 9	6 25	6 43	7 4	7 16	7 30	7 46	8 7	8 17	8 28	8 41	8 56	9 14
13	6 9	6 25	6 43	7 3	7 16	7 29	7 46	8 6	8 16	8 27	8 40	8 55	9 12
14	6 9	6 25	6 43	7 3	7 15	7 29	7 45	8 6	8 15	8 26	8 39	8 53	9 11
15	6 9	6 25	6 43	7 3	7 15	7 28	7 45	8 5	8 14	8 25	8 38	8 52	9 9
16	6 9	6 25	6 42	7 2	7 14	7 28	7 44	8 4	8 13	8 24	8 36	8 51	9 8
17	6 9	6 25	6 42	7 2	7 14	7 27	7 43	8 3	8 12	8 23	8 35	8 49	9 6
18	6 9	6 25	6 42	7 2	7 13	7 27	7 42	8 2	8 11	8 22	8 34	8 47	9 4
19	6 10	6 25	6 42	7 1	7 13	7 26	7 42	8 1	8 10	8 20	8 32	8 46	9 2
20	6 10	6 25	6 42	7 1	7 12	7 25	7 41	8 0	8 9	8 19	8 31	8 44	9 0
21	6 10	6 25	6 41	7 0	7 12	7 25	7 40	7 59	8 8	8 18	8 29	8 42	8 58
22	6 10	6 25	6 41	7 0	7 11	7 24	7 39	7 58	8 6	8 16	8 28	8 41	8 56
23	6 10	6 25	6 41	6 59	7 10	7 23	7 38	7 56	8 5	8 15	8 26	8 39	8 54
24	6 10	6 24	6 40	6 59	7 10	7 22	7 37	7 55	8 4	8 13	8 24	8 37	8 52
25	6 10	6 24	6 40	6 58	7 9	7 21	7 36	7 54	8 2	8 12	8 23	8 35	8 50
26	6 10	6 24	6 40	6 58	7 8	7 21	7 35	7 53	8 1	8 10	8 21	8 33	8 48
27	6 10	6 24	6 39	6 57	7 8	7 20	7 34	7 51	8 0	8 9	8 19	8 31	8 45
28	6 10	6 24	6 39	6 56	7 7	7 19	7 33	7 50	7 58	8 7	8 18	8 29	8 43
29	6 10	6 24	6 39	6 56	7 6	7 18	7 32	7 49	7 56	8 5	8 16	8 27	8 40
30	6 10	6 23	6 38	6 55	7 5	7 17	7 30	7 47	7 55	8 4	8 14	8 25	8 38
31	6 10	6 23	6 38	6 55	7 4	7 16	7 29	7 46	7 54	8 2	8 12	8 23	8 36
Aug. 1	6 10	6 23	6 37	6 54	7 4	7 15	7 28	7 44	7 52	8 0	8 10	8 21	8 33
2	6 9	6 23	6 37	6 53	7 3	7 14	7 27	7 43	7 50	7 58	8 8	8 18	8 31
3	6 9	6 22	6 36	6 52	7 2	7 13	7 26	7 41	7 48	7 57	8 6	8 16	8 28
4	6 9	6 22	6 36	6 52	7 1	7 12	7 24	7 40	7 47	7 55	8 4	8 14	8 26
5	6 9	6 22	6 35	6 51	7 0	7 10	7 23	7 38	7 45	7 53	8 2	8 12	8 23
6	6 9	6 22	6 35	6 50	6 59	7 9	7 21	7 36	7 43	7 51	8 0	8 9	8 21
7	6 9	6 21	6 34	6 49	6 59	7 8	7 20	7 35	7 41	7 49	7 58	8 7	8 18
8	6 9	6 21	6 34	6 48	6 57	7 7	7 19	7 33	7 40	7 47	7 55	8 5	8 15
9	6 9	6 20	6 33	6 48	6 56	7 6	7 17	7 31	7 38	7 45	7 53	8 2	8 13
10	6 9	6 20	6 32	6 47	6 55	7 5	7 16	7 29	7 36	7 43	7 51	8 0	8 10
11	6 8	6 20	6 32	6 46	6 54	7 3	7 14	7 28	7 34	7 41	7 49	7 57	8 7
12	6 8	6 19	6 31	6 45	6 53	7 2	7 13	7 26	7 32	7 39	7 46	7 55	8 5
13	6 8	6 19	6 30	6 44	6 52	7 1	7 11	7 24	7 30	7 37	7 44	7 52	8 2
14	6 8	6 18	6 30	6 43	6 51	7 0	7 10	7 22	7 28	7 35	7 42	7 50	7 59
15	6 8	6 18	6 29	6 42	6 50	6 58	7 8	7 20	7 26	7 32	7 40	7 47	7 56
16	6 8	6 18	6 28	6 41	6 48	6 57	7 6	7 18	7 24	7 30	7 37	7 45	7 54
17	6 7	6 17	6 28	6 40	6 47	6 56	7 5	7 17	7 22	7 28	7 35	7 42	7 51

TABLE VIII.

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 720.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Aug. 16	18 1	17 51	17 40	17 28	17 20	17 12	17 2	16 51	16 45	16 39	16 32	16 25	16 16
17	18 1	17 51	17 40	17 28	17 21	17 13	17 4	16 52	16 47	16 41	16 34	16 27	16 18
18	18 0	17 51	17 41	17 29	17 22	17 14	17 5	16 54	16 48	16 43	16 36	16 29	16 21
19	18 0	17 51	17 41	17 29	17 23	17 15	17 6	16 55	16 50	16 44	16 38	16 31	16 23
20	18 0	17 51	17 41	17 30	17 23	17 16	17 7	16 57	16 52	16 46	16 40	16 33	16 26
21	18 0	17 51	17 42	17 31	17 24	17 17	17 8	16 58	16 53	16 48	16 42	16 36	16 28
22	17 59	17 51	17 42	17 31	17 25	17 18	17 10	17 0	16 55	16 50	16 44	16 38	16 30
23	17 59	17 51	17 42	17 32	17 26	17 19	17 11	17 1	16 57	16 52	16 46	16 40	16 33
24	17 59	17 51	17 42	17 32	17 26	17 20	17 12	17 3	16 58	16 53	16 48	16 42	16 35
25	17 59	17 51	17 42	17 33	17 27	17 21	17 13	17 4	17 0	16 55	16 50	16 44	16 38
26	17 58	17 51	17 43	17 33	17 28	17 22	17 14	17 6	17 2	16 57	16 52	16 46	16 40
27	17 58	17 51	17 43	17 34	17 29	17 23	17 16	17 7	17 3	16 59	16 54	16 48	16 42
28	17 58	17 51	17 43	17 34	17 29	17 24	17 17	17 8	17 5	17 0	16 56	16 51	16 45
29	17 58	17 51	17 44	17 35	17 30	17 24	17 18	17 10	17 6	17 2	16 58	16 53	16 47
30	17 57	17 51	17 44	17 36	17 31	17 25	17 19	17 12	17 8	17 4	17 0	16 55	16 50
31	17 57	17 51	17 44	17 36	17 32	17 26	17 20	17 13	17 10	17 6	17 2	16 57	16 52
Sept. 1	17 57	17 51	17 44	17 37	17 32	17 27	17 22	17 14	17 11	17 8	17 4	16 59	16 54
2	17 56	17 51	17 44	17 37	17 33	17 28	17 23	17 16	17 13	17 9	17 6	17 1	16 57
3	17 56	17 51	17 45	17 38	17 34	17 29	17 24	17 18	17 14	17 11	17 8	17 4	16 59
4	17 56	17 50	17 45	17 38	17 34	17 30	17 25	17 19	17 16	17 13	17 10	17 6	17 2
5	17 55	17 50	17 45	17 39	17 35	17 31	17 26	17 20	17 18	17 15	17 12	17 8	17 4
6	17 55	17 50	17 45	17 40	17 36	17 32	17 28	17 22	17 19	17 17	17 14	17 10	17 6
7	17 55	17 50	17 46	17 40	17 37	17 33	17 29	17 24	17 21	17 18	17 15	17 12	17 8
8	17 54	17 50	17 46	17 41	17 38	17 34	17 30	17 25	17 23	17 20	17 17	17 14	17 11
9	17 54	17 50	17 46	17 41	17 38	17 35	17 31	17 26	17 24	17 22	17 19	17 16	17 13
10	17 54	17 50	17 46	17 42	17 39	17 36	17 32	17 28	17 26	17 24	17 21	17 19	17 16
11	17 53	17 50	17 46	17 42	17 40	17 37	17 34	17 29	17 28	17 26	17 23	17 21	17 18
12	17 53	17 50	17 47	17 43	17 40	17 38	17 35	17 31	17 29	17 27	17 25	17 23	17 20
13	17 53	17 50	17 47	17 43	17 41	17 39	17 36	17 32	17 31	17 29	17 27	17 25	17 23
14	17 52	17 50	17 47	17 44	17 42	17 40	17 37	17 34	17 32	17 31	17 29	17 27	17 25
15	17 52	17 50	17 47	17 44	17 43	17 41	17 38	17 35	17 34	17 33	17 31	17 29	17 27
16	17 52	17 50	17 48	17 45	17 43	17 42	17 40	17 37	17 36	17 34	17 33	17 31	17 30
17	17 51	17 50	17 48	17 46	17 44	17 43	17 41	17 38	17 38	17 36	17 35	17 34	17 32
18	17 51	17 50	17 48	17 46	17 45	17 44	17 42	17 40	17 39	17 38	17 37	17 36	17 34
19	17 50	17 49	17 48	17 46	17 46	17 44	17 43	17 41	17 41	17 40	17 39	17 38	17 37
20	17 50	17 49	17 48	17 47	17 46	17 45	17 44	17 43	17 42	17 42	17 41	17 40	17 39
21	17 50	17 49	17 49	17 48	17 47	17 46	17 46	17 44	17 44	17 43	17 43	17 42	17 41
22	17 50	17 49	17 49	17 48	17 48	17 47	17 47	17 46	17 46	17 45	17 45	17 44	17 44
23	17 49	17 49	17 49	17 49	17 48	17 48	17 48	17 47	17 47	17 47	17 47	17 46	17 46
24	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 48	17 48
25	17 48	17 49	17 49	17 50	17 50	17 50	17 50	17 50	17 50	17 51	17 51	17 51	17 51
26	17 48	17 49	17 50	17 50	17 51	17 51	17 52	17 52	17 52	17 52	17 53	17 53	17 53
27	17 48	17 49	17 50	17 51	17 52	17 52	17 53	17 54	17 54	17 54	17 55	17 55	17 56
28	17 47	17 49	17 50	17 52	17 52	17 53	17 54	17 55	17 56	17 56	17 57	17 57	17 58
29	17 47	17 49	17 50	17 52	17 53	17 54	17 55	17 57	17 57	17 58	17 59	17 59	18 0
30	17 47	17 49	17 51	17 53	17 54	17 55	17 56	17 58	17 59	18 0	18 1	18 2	18 3
Oct. 1	17 46	17 49	17 51	17 53	17 55	17 56	17 58	18 0	18 0	18 2	18 3	18 4	18 5

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET, MERIDIAN OF GREENWICH, 1919.

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To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 720.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Aug. 17	6 7	6 17	6 28	6 40	6 47	6 56	7 5	7 17	7 22	7 28	7 35	7 42	7 51
18	6 7	6 17	6 27	6 39	6 46	6 54	7 3	7 15	7 20	7 26	7 32	7 40	7 48
19	6 7	6 16	6 26	6 38	6 45	6 53	7 2	7 13	7 18	7 24	7 30	7 37	7 45
20	6 7	6 16	6 26	6 37	6 44	6 51	7 0	7 11	7 16	7 21	7 28	7 34	7 42
21	6 6	6 15	6 25	6 36	6 42	6 50	6 58	7 9	7 14	7 19	7 25	7 32	7 39
22	6 6	6 15	6 24	6 35	6 41	6 48	6 57	7 7	7 12	7 17	7 23	7 29	7 36
23	6 6	6 14	6 23	6 34	6 40	6 47	6 55	7 5	7 10	7 15	7 20	7 27	7 34
24	6 6	6 14	6 23	6 33	6 39	6 46	6 53	7 3	7 8	7 12	7 18	7 24	7 31
25	6 6	6 13	6 22	6 32	6 38	6 44	6 52	7 1	7 5	7 10	7 15	7 21	7 28
26	6 5	6 13	6 21	6 31	6 36	6 43	6 50	6 59	7 3	7 8	7 13	7 18	7 25
27	6 5	6 12	6 20	6 29	6 35	6 41	6 48	6 57	7 1	7 5	7 10	7 16	7 22
28	6 5	6 12	6 19	6 28	6 34	6 40	6 46	6 55	6 59	7 3	7 8	7 13	7 19
29	6 4	6 11	6 18	6 27	6 32	6 38	6 45	6 53	6 56	7 0	7 5	7 10	7 16
30	6 4	6 10	6 18	6 26	6 31	6 36	6 43	6 51	6 54	6 58	7 2	7 8	7 13
31	6 4	6 10	6 17	6 25	6 30	6 35	6 41	6 48	6 52	6 56	7 0	7 5	7 10
Sept. 1	6 3	6 9	6 16	6 24	6 28	6 33	6 39	6 46	6 50	6 53	6 57	7 2	7 7
2	6 3	6 9	6 15	6 22	6 27	6 32	6 37	6 44	6 48	6 51	6 55	6 59	7 4
3	6 3	6 8	6 14	6 21	6 26	6 30	6 36	6 42	6 45	6 49	6 52	6 56	7 1
4	6 2	6 8	6 13	6 20	6 24	6 28	6 34	6 40	6 43	6 46	6 50	6 54	6 58
5	6 2	6 7	6 13	6 19	6 23	6 27	6 32	6 38	6 41	6 44	6 47	6 51	6 55
6	6 2	6 6	6 12	6 18	6 21	6 25	6 30	6 36	6 38	6 41	6 44	6 48	6 52
7	6 2	6 6	6 11	6 16	6 20	6 24	6 28	6 34	6 36	6 39	6 42	6 45	6 49
8	6 1	6 5	6 10	6 15	6 18	6 22	6 26	6 31	6 34	6 36	6 39	6 42	6 46
9	6 1	6 5	6 9	6 14	6 17	6 20	6 24	6 29	6 31	6 34	6 36	6 40	6 43
10	6 0	6 4	6 8	6 13	6 16	6 19	6 22	6 27	6 29	6 31	6 34	6 37	6 40
11	6 0	6 3	6 7	6 12	6 14	6 17	6 21	6 25	6 27	6 29	6 31	6 34	6 37
12	6 0	6 3	6 6	6 10	6 13	6 16	6 19	6 23	6 24	6 26	6 29	6 31	6 34
13	5 59	6 2	6 5	6 9	6 11	6 14	6 17	6 21	6 22	6 24	6 26	6 28	6 31
14	5 59	6 2	6 4	6 8	6 10	6 12	6 15	6 18	6 20	6 22	6 23	6 26	6 28
15	5 59	6 1	6 4	6 7	6 9	6 11	6 13	6 16	6 18	6 19	6 21	6 23	6 25
16	5 58	6 0	6 3	6 5	6 7	6 9	6 11	6 14	6 15	6 16	6 18	6 20	6 22
17	5 58	6 0	6 2	6 4	6 6	6 7	6 9	6 12	6 13	6 14	6 15	6 17	6 18
18	5 58	5 59	6 1	6 3	6 4	6 6	6 7	6 10	6 10	6 11	6 13	6 14	6 15
19	5 57	5 58	6 0	6 2	6 3	6 4	6 5	6 7	6 8	6 9	6 10	6 11	6 12
20	5 57	5 58	5 59	6 0	6 1	6 2	6 4	6 5	6 6	6 6	6 7	6 8	6 9
21	5 56	5 57	5 58	5 59	6 0	6 1	6 2	6 3	6 3	6 4	6 4	6 6	6 6
22	5 56	5 57	5 57	5 58	5 58	5 59	6 0	6 1	6 1	6 2	6 2	6 3	6 3
23	5 56	5 56	5 56	5 57	5 57	5 57	5 58	5 58	5 59	5 59	5 59	6 0	6 0
24	5 56	5 55	5 55	5 56	5 56	5 56	5 56	5 56	5 56	5 56	5 57	5 57	5 57
25	5 55	5 55	5 54	5 54	5 54	5 54	5 54	5 54	5 54	5 54	5 54	5 54	5 54
26	5 55	5 54	5 54	5 53	5 53	5 52	5 52	5 52	5 52	5 52	5 51	5 51	5 51
27	5 54	5 54	5 53	5 52	5 51	5 51	5 50	5 50	5 49	5 49	5 49	5 48	5 48
28	5 54	5 53	5 52	5 50	5 50	5 49	5 48	5 47	5 47	5 46	5 46	5 46	5 45
29	5 54	5 52	5 51	5 49	5 48	5 48	5 46	5 45	5 45	5 44	5 43	5 43	5 42
30	5 54	5 52	5 50	5 48	5 47	5 46	5 44	5 43	5 42	5 42	5 41	5 40	5 39
Oct. 1	5 53	5 51	5 49	5 47	5 46	5 44	5 43	5 41	5 40	5 39	5 38	5 37	5 36
2	5 53	5 50	5 48	5 46	5 44	5 43	5 41	5 39	5 38	5 37	5 36	5 34	5 33

TABLE VIII.

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 720.

Lat. Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct. 1	17 46	17 49	17 51	17 53	17 55	17 56	17 58	18 0	18 0	18 2	18 3	18 4	18 5
2	17 46	17 49	17 51	17 54	17 55	17 57	17 59	18 1	18 2	18 3	18 5	18 6	18 8
3	17 46	17 49	17 51	17 54	17 56	17 58	18 0	18 3	18 4	18 5	18 7	18 8	18 10
4	17 46	17 48	17 52	17 55	17 57	17 59	18 1	18 4	18 6	18 7	18 9	18 10	18 12
5	17 45	17 48	17 52	17 56	17 58	18 0	18 3	18 6	18 7	18 9	18 11	18 12	18 15
6	17 45	17 48	17 52	17 56	17 58	18 1	18 4	18 7	18 9	18 11	18 13	18 15	18 17
7	17 45	17 48	17 52	17 57	17 59	18 2	18 5	18 9	18 11	18 13	18 15	18 17	18 19
8	17 44	17 48	17 53	17 57	18 0	18 3	18 6	18 11	18 12	18 14	18 17	18 19	18 22
9	17 44	17 48	17 53	17 58	18 1	18 4	18 8	18 12	18 14	18 16	18 19	18 21	18 24
10	17 44	17 48	17 53	17 58	18 2	18 5	18 9	18 14	18 16	18 18	18 21	18 24	18 27
11	17 44	17 48	17 54	17 59	18 2	18 6	18 10	18 15	18 18	18 20	18 23	18 26	18 29
12	17 43	17 48	17 54	18 0	18 3	18 7	18 12	18 17	18 19	18 22	18 25	18 28	18 32
13	17 43	17 48	17 54	18 0	18 4	18 8	18 13	18 18	18 21	18 24	18 27	18 30	18 34
14	17 43	17 48	17 54	18 1	18 5	18 9	18 14	18 20	18 23	18 26	18 29	18 32	18 36
15	17 43	17 49	17 55	18 2	18 6	18 10	18 16	18 22	18 24	18 28	18 31	18 35	18 39
16	17 42	17 49	17 55	18 2	18 7	18 11	18 17	18 23	18 26	18 29	18 33	18 37	18 41
17	17 42	17 49	17 56	18 3	18 8	18 12	18 18	18 25	18 28	18 31	18 35	18 39	18 44
18	17 42	17 49	17 56	18 4	18 8	18 13	18 19	18 26	18 30	18 33	18 37	18 42	18 46
19	17 42	17 49	17 56	18 4	18 9	18 14	18 21	18 28	18 31	18 35	18 39	18 44	18 49
20	17 42	17 49	17 57	18 5	18 10	18 16	18 22	18 30	18 33	18 37	18 41	18 46	18 51
21	17 41	17 49	17 57	18 6	18 11	18 17	18 23	18 31	18 35	18 39	18 43	18 48	18 54
22	17 41	17 49	17 57	18 6	18 12	18 18	18 25	18 33	18 37	18 41	18 45	18 51	18 56
23	17 41	17 49	17 58	18 7	18 13	18 19	18 26	18 35	18 38	18 43	18 48	18 53	18 59
24	17 41	17 49	17 58	18 8	18 14	18 20	18 28	18 36	18 40	18 45	18 50	18 55	19 2
25	17 41	17 50	17 59	18 9	18 14	18 21	18 29	18 38	18 42	18 47	18 52	18 58	19 4
26	17 41	17 50	17 59	18 10	18 15	18 22	18 30	18 40	18 44	18 49	18 54	19 0	19 6
27	17 41	17 50	17 59	18 10	18 16	18 23	18 32	18 41	18 46	18 51	18 56	19 2	19 9
28	17 40	17 50	18 0	18 11	18 17	18 24	18 33	18 43	18 47	18 53	18 58	19 4	19 12
29	17 40	17 50	18 0	18 12	18 18	18 26	18 34	18 44	18 49	18 55	19 0	19 7	19 14
30	17 40	17 50	18 1	18 12	18 19	18 27	18 36	18 46	18 51	18 56	19 2	19 9	19 17
31	17 40	17 50	18 1	18 13	18 20	18 28	18 37	18 48	18 53	18 58	19 5	19 12	19 19
Nov. 1	17 40	17 51	18 2	18 14	18 21	18 29	18 38	18 50	18 55	19 0	19 7	19 14	19 22
2	17 40	17 51	18 2	18 15	18 22	18 30	18 40	18 51	18 56	19 2	19 9	19 16	19 24
3	17 40	17 51	18 2	18 16	18 23	18 31	18 41	18 53	18 58	19 4	19 11	19 18	19 27
4	17 40	17 51	18 3	18 16	18 24	18 32	18 42	18 54	19 0	19 6	19 13	19 21	19 30
5	17 40	17 52	18 4	18 17	18 25	18 34	18 44	18 56	19 2	19 8	19 15	19 23	19 32
6	17 40	17 52	18 4	18 18	18 26	18 35	18 45	18 58	19 4	19 10	19 17	19 26	19 35
7	17 40	17 52	18 4	18 19	18 27	18 36	18 47	19 0	19 6	19 12	19 20	19 28	19 37
8	17 40	17 52	18 5	18 19	18 28	18 37	18 48	19 1	19 7	19 14	19 22	19 30	19 40
9	17 40	17 53	18 6	18 20	18 29	18 38	18 49	19 3	19 9	19 16	19 24	19 32	19 42
10	17 41	17 53	18 6	18 21	18 30	18 39	18 51	19 4	19 11	19 18	19 26	19 35	19 45
11	17 41	17 53	18 6	18 22	18 31	18 40	18 52	19 6	19 13	19 20	19 28	19 37	19 48
12	17 41	17 54	18 7	18 23	18 32	18 42	18 53	19 8	19 14	19 22	19 30	19 39	19 50
13	17 41	17 54	18 8	18 24	18 33	18 43	18 55	19 9	19 16	19 24	19 32	19 42	19 53
14	17 41	17 54	18 8	18 24	18 34	18 44	18 56	19 11	19 18	19 26	19 34	19 44	19 55
15	17 41	17 55	18 9	18 25	18 34	18 45	18 58	19 13	19 20	19 28	19 36	19 46	19 58
16	17 41	17 55	18 10	18 26	18 35	18 46	18 59	19 14	19 22	19 29	19 38	19 48	20 0

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 720.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct. 2	5 53	5 50	5 48	5 46	5 44	5 43	5 41	5 39	5 38	5 37	5 36	5 34	5 33
3	5 52	5 50	5 47	5 44	5 43	5 41	5 39	5 36	5 35	5 34	5 33	5 32	5 30
4	5 52	5 49	5 46	5 43	5 42	5 39	5 37	5 34	5 33	5 32	5 30	5 29	5 27
5	5 52	5 49	5 46	5 42	5 40	5 38	5 35	5 32	5 31	5 29	5 28	5 26	5 24
6	5 52	5 48	5 45	5 41	5 39	5 36	5 33	5 30	5 28	5 27	5 25	5 23	5 21
7	5 51	5 48	5 44	5 40	5 37	5 35	5 32	5 28	5 26	5 24	5 22	5 20	5 18
8	5 51	5 47	5 43	5 38	5 36	5 33	5 30	5 26	5 24	5 22	5 20	5 18	5 15
9	5 51	5 46	5 42	5 37	5 34	5 31	5 28	5 24	5 22	5 20	5 17	5 15	5 12
10	5 50	5 46	5 41	5 36	5 33	5 30	5 26	5 22	5 20	5 17	5 15	5 12	5 9
11	5 50	5 45	5 40	5 35	5 32	5 28	5 24	5 19	5 17	5 15	5 12	5 9	5 6
12	5 50	5 45	5 40	5 34	5 30	5 27	5 22	5 17	5 15	5 12	5 10	5 6	5 3
13	5 50	5 44	5 39	5 33	5 29	5 25	5 21	5 15	5 13	5 10	5 7	5 4	5 0
14	5 50	5 44	5 38	5 32	5 28	5 24	5 19	5 13	5 11	5 8	5 5	5 1	4 57
15	5 49	5 43	5 37	5 30	5 27	5 22	5 17	5 11	5 8	5 5	5 2	4 58	4 54
16	5 49	5 43	5 37	5 29	5 25	5 21	5 15	5 9	5 6	5 3	5 0	4 56	4 51
17	5 49	5 42	5 36	5 28	5 24	5 19	5 14	5 7	5 4	5 1	4 57	4 53	4 48
18	5 49	5 42	5 35	5 27	5 23	5 18	5 12	5 5	5 2	4 58	4 55	4 50	4 46
19	5 48	5 42	5 34	5 26	5 22	5 16	5 10	5 3	5 0	4 56	4 52	4 48	4 43
20	5 48	5 41	5 34	5 25	5 20	5 15	5 8	5 1	4 58	4 54	4 50	4 45	4 40
21	5 48	5 41	5 33	5 24	5 19	5 13	5 7	4 59	4 56	4 52	4 47	4 42	4 37
22	5 48	5 40	5 32	5 23	5 18	5 12	5 5	4 57	4 53	4 49	4 45	4 40	4 34
23	5 48	5 40	5 32	5 22	5 17	5 11	5 4	4 55	4 51	4 47	4 42	4 37	4 31
24	5 48	5 39	5 31	5 21	5 16	5 9	5 2	4 53	4 49	4 45	4 40	4 35	4 28
25	5 48	5 39	5 30	5 20	5 14	5 8	5 0	4 51	4 47	4 43	4 38	4 32	4 26
26	5 47	5 39	5 30	5 19	5 13	5 7	4 59	4 50	4 45	4 40	4 35	4 30	4 23
27	5 47	5 38	5 29	5 18	5 12	5 5	4 57	4 48	4 43	4 38	4 33	4 27	4 20
28	5 47	5 38	5 28	5 17	5 11	5 4	4 56	4 46	4 41	4 36	4 31	4 24	4 18
29	5 47	5 38	5 28	5 16	5 10	5 3	4 54	4 44	4 39	4 34	4 28	4 22	4 15
30	5 47	5 37	5 27	5 16	5 9	5 2	4 53	4 42	4 38	4 32	4 26	4 20	4 12
31	5 47	5 37	5 27	5 15	5 8	5 0	4 51	4 40	4 36	4 30	4 24	4 17	4 10
Nov. 1	5 47	5 37	5 26	5 14	5 7	4 59	4 50	4 39	4 34	4 28	4 22	4 15	4 7
2	5 47	5 37	5 26	5 13	5 6	4 58	4 48	4 37	4 32	4 26	4 20	4 12	4 4
3	5 47	5 36	5 25	5 12	5 5	4 57	4 47	4 35	4 30	4 24	4 18	4 10	4 2
4	5 47	5 36	5 25	5 12	5 4	4 56	4 46	4 34	4 28	4 22	4 15	4 8	3 59
5	5 47	5 36	5 24	5 11	5 3	4 54	4 44	4 32	4 26	4 20	4 13	4 5	3 56
6	5 47	5 36	5 24	5 10	5 2	4 53	4 43	4 30	4 25	4 18	4 11	4 3	3 54
7	5 47	5 36	5 23	5 9	5 1	4 52	4 42	4 29	4 23	4 16	4 9	4 1	3 52
8	5 47	5 35	5 23	5 9	5 0	4 51	4 40	4 27	4 21	4 15	4 7	3 59	3 49
9	5 47	5 35	5 22	5 8	5 0	4 50	4 39	4 26	4 20	4 13	4 5	3 56	3 47
10	5 48	5 35	5 22	5 7	4 59	4 49	4 38	4 24	4 18	4 11	4 3	3 54	3 44
11	5 48	5 35	5 22	5 7	4 58	4 48	4 37	4 23	4 16	4 9	4 1	3 52	3 42
12	5 48	5 35	5 21	5 6	4 57	4 47	4 36	4 21	4 15	4 8	3 59	3 50	3 40
13	5 48	5 35	5 21	5 6	4 57	4 46	4 34	4 20	4 13	4 6	3 58	3 48	3 37
14	5 48	5 35	5 21	5 5	4 56	4 46	4 33	4 19	4 12	4 4	3 56	3 46	3 35
15	5 48	5 35	5 20	5 4	4 55	4 45	4 32	4 17	4 10	4 3	3 54	3 44	3 33
16	5 48	5 35	5 20	5 4	4 55	4 44	4 31	4 16	4 9	4 1	3 52	3 42	3 31
17	5 48	5 35	5 20	5 4	4 54	4 43	4 30	4 15	4 8	4 0	3 51	3 40	3 28

TABLE VIII.

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 720.

Lat. / Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Nov. 16	17 41	17 55	18 10	18 26	18 35	18 46	18 59	19 14	19 22	19 29	19 38	19 48	20 0
17	17 42	17 56	18 10	18 27	18 36	18 47	19 0	19 16	19 23	19 31	19 40	19 51	20 3
18	17 42	17 56	18 11	18 28	18 37	18 48	19 2	19 18	19 25	19 33	19 42	19 53	20 5
19	17 42	17 56	18 11	18 28	18 38	18 50	19 3	19 19	19 27	19 35	19 44	19 55	20 8
20	17 42	17 57	18 12	18 29	18 39	18 51	19 4	19 21	19 28	19 37	19 46	19 57	20 10
21	17 42	17 57	18 13	18 30	18 40	18 52	19 6	19 22	19 30	19 39	19 48	20 0	20 12
22	17 43	17 58	18 13	18 31	18 41	18 53	19 7	19 24	19 32	19 40	19 50	20 2	20 15
23	17 43	17 58	18 14	18 32	18 42	18 54	19 8	19 25	19 33	19 42	19 52	20 4	20 17
24	17 43	17 58	18 14	18 33	18 43	18 55	19 9	19 27	19 35	19 44	19 54	20 6	20 20
25	17 44	17 59	18 15	18 34	18 44	18 56	19 11	19 28	19 37	19 46	19 56	20 8	20 22
26	17 44	17 59	18 16	18 34	18 45	18 57	19 12	19 30	19 38	19 47	19 58	20 10	20 24
27	17 44	18 0	18 16	18 35	18 46	18 58	19 13	19 31	19 40	19 49	20 0	20 12	20 26
28	17 44	18 0	18 17	18 36	18 47	19 0	19 14	19 33	19 41	19 51	20 2	20 14	20 29
29	17 45	18 1	18 18	18 37	18 48	19 1	19 16	19 34	19 43	19 52	20 3	20 16	20 31
30	17 45	18 1	18 18	18 38	18 49	19 2	19 17	19 35	19 44	19 54	20 5	20 18	20 33
Dec. 1	17 46	18 2	18 19	18 38	18 50	19 3	19 18	19 37	19 46	19 56	20 7	20 20	20 35
2	17 46	18 2	18 20	18 39	18 51	19 4	19 19	19 38	19 47	19 57	20 8	20 22	20 37
3	17 46	18 3	18 20	18 40	18 51	19 5	19 20	19 39	19 48	19 58	20 10	20 23	20 39
4	17 47	18 3	18 21	18 41	18 52	19 6	19 21	19 41	19 50	20 0	20 12	20 25	20 41
5	17 47	18 4	18 21	18 42	18 53	19 7	19 22	19 42	19 51	20 1	20 13	20 27	20 43
6	17 48	18 4	18 22	18 42	18 54	19 8	19 24	19 43	19 52	20 3	20 14	20 28	20 44
7	17 48	18 5	18 23	18 43	18 55	19 8	19 25	19 44	19 54	20 4	20 16	20 30	20 46
8	17 48	18 5	18 23	18 44	18 56	19 9	19 26	19 45	19 55	20 5	20 17	20 31	20 48
9	17 49	18 6	18 24	18 44	18 56	19 10	19 27	19 46	19 56	20 7	20 19	20 33	20 49
10	17 49	18 6	18 24	18 45	18 57	19 11	19 27	19 47	19 57	20 8	20 20	20 34	20 51
11	17 50	18 7	18 25	18 46	18 58	19 12	19 28	19 48	19 58	20 9	20 21	20 35	20 52
12	17 50	18 7	18 26	18 46	18 59	19 13	19 29	19 49	19 59	20 10	20 22	20 37	20 54
13	17 51	18 8	18 26	18 47	18 59	19 13	19 30	19 50	20 0	20 11	20 23	20 38	20 55
14	17 51	18 8	18 27	18 48	19 0	19 14	19 31	19 51	20 1	20 12	20 24	20 39	20 56
15	17 52	18 9	18 27	18 48	19 1	19 15	19 32	19 52	20 2	20 13	20 25	20 40	20 57
16	17 52	18 10	18 28	18 49	19 1	19 16	19 32	19 53	20 3	20 14	20 26	20 41	20 58
17	17 53	18 10	18 28	18 50	19 2	19 16	19 33	19 54	20 4	20 14	20 27	20 42	20 59
18	17 53	18 10	18 29	18 50	19 3	19 17	19 34	19 54	20 4	20 15	20 28	20 43	21 0
19	17 54	18 11	18 30	18 51	19 3	19 17	19 34	19 55	20 5	20 16	20 29	20 43	21 1
20	17 54	18 12	18 30	18 51	19 4	19 18	19 35	19 56	20 6	20 17	20 29	20 44	21 2
21	17 55	18 12	18 31	18 52	19 4	19 18	19 35	19 56	20 6	20 17	20 30	20 45	21 2
22	17 55	18 12	18 31	18 52	19 5	19 19	19 36	19 57	20 7	20 18	20 30	20 45	21 3
23	17 56	18 13	18 32	18 53	19 5	19 19	19 36	19 57	20 7	20 18	20 31	20 46	21 3
24	17 56	18 13	18 32	18 53	19 6	19 20	19 37	19 57	20 7	20 18	20 31	20 46	21 4
25	17 57	18 14	18 32	18 54	19 6	19 20	19 37	19 58	20 8	20 19	20 32	20 46	21 4
26	17 57	18 14	18 33	18 54	19 6	19 21	19 37	19 58	20 8	20 19	20 32	20 46	21 4
27	17 58	18 15	18 33	18 55	19 7	19 21	19 38	19 58	20 8	20 19	20 32	20 47	21 4
28	17 58	18 15	18 34	18 55	19 7	19 21	19 38	19 59	20 8	20 20	20 32	20 47	21 4
29	17 58	18 16	18 34	18 55	19 8	19 22	19 38	19 59	20 8	20 20	20 32	20 47	21 4
30	17 59	18 16	18 35	18 56	19 8	19 22	19 38	19 59	20 8	20 20	20 32	20 46	21 4
31	18 0	18 17	18 35	18 56	19 8	19 22	19 39	19 59	20 8	20 20	20 32	20 46	21 3

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 720.

Lat. Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Nov. 17	5 48	5 35	5 20	5 4	4 54	4 43	4 30	4 15	4 8	4 0	3 51	3 40	3 28
18	5 49	5 35	5 20	5 3	4 53	4 42	4 29	4 14	4 6	3 58	3 49	3 38	3 26
19	5 49	5 35	5 20	5 3	4 53	4 42	4 28	4 12	4 5	3 57	3 47	3 37	3 24
20	5 49	5 35	5 20	5 2	4 52	4 41	4 28	4 11	4 4	3 55	3 46	3 35	3 22
21	5 49	5 35	5 20	5 2	4 52	4 40	4 27	4 10	4 2	3 54	3 44	3 33	3 20
22	5 50	5 35	5 19	5 2	4 51	4 40	4 26	4 9	4 1	3 53	3 43	3 32	3 19
23	5 50	5 35	5 19	5 1	4 51	4 39	4 25	4 8	4 0	3 51	3 41	3 30	3 17
24	5 50	5 35	5 19	5 1	4 50	4 39	4 24	4 7	3 59	3 50	3 40	3 28	3 15
25	5 51	5 35	5 19	5 1	4 50	4 38	4 24	4 6	3 58	3 49	3 39	3 27	3 13
26	5 51	5 35	5 19	5 1	4 50	4 38	4 23	4 6	3 57	3 48	3 38	3 26	3 12
27	5 51	5 36	5 19	5 0	4 50	4 37	4 22	4 5	3 56	3 47	3 36	3 24	3 10
28	5 51	5 36	5 19	5 0	4 49	4 37	4 22	4 4	3 55	3 46	3 35	3 23	3 8
29	5 52	5 36	5 19	5 0	4 49	4 36	4 21	4 3	3 54	3 45	3 34	3 22	3 7
30	5 52	5 36	5 19	5 0	4 49	4 36	4 21	4 2	3 54	3 44	3 33	3 20	3 5
Dec. 1	5 52	5 36	5 19	5 0	4 49	4 36	4 20	4 2	3 53	3 43	3 32	3 19	3 4
2	5 53	5 37	5 20	5 0	4 48	4 36	4 20	4 1	3 52	3 42	3 31	3 18	3 3
3	5 53	5 37	5 20	5 0	4 48	4 35	4 20	4 1	3 52	3 42	3 30	3 17	3 2
4	5 54	5 37	5 20	5 0	4 48	4 35	4 19	4 0	3 51	3 41	3 30	3 16	3 0
5	5 54	5 38	5 20	5 0	4 48	4 35	4 19	4 0	3 51	3 40	3 29	3 15	2 59
6	5 54	5 38	5 20	5 0	4 48	4 35	4 19	3 59	3 50	3 40	3 28	3 14	2 58
7	5 55	5 38	5 20	5 0	4 48	4 35	4 19	3 59	3 50	3 39	3 27	3 14	2 57
8	5 55	5 38	5 21	5 0	4 48	4 35	4 18	3 59	3 49	3 39	3 27	3 13	2 57
9	5 56	5 39	5 21	5 0	4 48	4 35	4 18	3 58	3 49	3 38	3 26	3 12	2 56
10	5 56	5 39	5 21	5 0	4 48	4 35	4 18	3 58	3 49	3 38	3 26	3 12	2 55
11	5 57	5 40	5 22	5 1	4 49	4 35	4 18	3 58	3 49	3 38	3 26	3 11	2 55
12	5 57	5 40	5 22	5 1	4 49	4 35	4 18	3 58	3 48	3 38	3 25	3 11	2 54
13	5 58	5 40	5 22	5 1	4 49	4 35	4 18	3 58	3 48	3 38	3 25	3 11	2 54
14	5 58	5 41	5 22	5 2	4 49	4 35	4 19	3 58	3 48	3 38	3 25	3 11	2 54
15	5 58	5 41	5 23	5 2	4 50	4 36	4 19	3 58	3 48	3 38	3 25	3 10	2 53
16	5 59	5 42	5 23	5 2	4 50	4 36	4 19	3 58	3 49	3 38	3 25	3 10	2 53
17	6 0	5 42	5 24	5 2	4 50	4 36	4 19	3 59	3 49	3 38	3 25	3 10	2 53
18	6 0	5 42	5 24	5 3	4 50	4 36	4 20	3 59	3 49	3 38	3 25	3 10	2 53
19	6 0	5 43	5 25	5 3	4 51	4 37	4 20	3 59	3 49	3 38	3 25	3 11	2 53
20	6 1	5 44	5 25	5 4	4 51	4 37	4 20	4 0	3 50	3 38	3 26	3 11	2 53
21	6 2	5 44	5 26	5 4	4 52	4 38	4 21	4 0	3 50	3 39	3 26	3 11	2 54
22	6 2	5 44	5 26	5 5	4 52	4 38	4 21	4 0	3 50	3 39	3 27	3 12	2 54
23	6 2	5 45	5 26	5 5	4 53	4 39	4 22	4 1	3 51	3 40	3 27	3 12	2 55
24	6 3	5 46	5 27	5 6	4 53	4 39	4 22	4 2	3 52	3 40	3 28	3 13	2 55
25	6 3	5 46	5 28	5 6	4 54	4 40	4 23	4 2	3 52	3 41	3 28	3 14	2 56
26	6 4	5 47	5 28	5 7	4 54	4 40	4 24	4 3	3 53	3 42	3 29	3 14	2 57
27	6 4	5 47	5 29	5 7	4 55	4 41	4 24	4 4	3 54	3 43	3 30	3 15	2 58
28	6 5	5 48	5 29	5 8	4 56	4 42	4 25	4 4	3 54	3 43	3 31	3 16	2 59
29	6 6	5 48	5 30	5 9	4 56	4 42	4 26	4 5	3 55	3 44	3 32	3 17	3 0
30	6 6	5 49	5 30	5 9	4 57	4 43	4 26	4 6	3 56	3 45	3 33	3 18	3 1
31	6 6	5 49	5 31	5 10	4 58	4 44	4 27	4 7	3 57	3 46	3 34	3 19	3 2
32	6 7	5 50	5 32	5 11	4 59	4 45	4 28	4 8	3 58	3 47	3 35	3 21	3 4

TABLE X.

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 704.

For other longitudes and for southern latitudes see page 738.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan. 0	17 5	17 22	17 41	18 2	18 14	18 28	18 45	19 6	19 16	19 27	19 40	19 54	20 11
1	17 58	18 14	18 31	18 50	19 2	19 15	19 30	19 49	19 58	20 8	20 19	20 32	20 46
2	18 50	19 4	19 19	19 36	19 45	19 56	20 9	20 25	20 32	20 40	20 50	21 0	21 12
3	19 42	19 53	20 4	20 17	20 25	20 33	20 43	20 55	21 1	21 7	21 14	21 22	21 30
4	20 32	20 39	20 47	20 56	21 1	21 7	21 14	21 22	21 25	21 29	21 34	21 39	21 44
5	21 21	21 25	21 29	21 33	21 35	21 38	21 41	21 45	21 47	21 49	21 51	21 53	21 56
6	22 10	22 10	22 10	22 9	22 9	22 8	22 8	22 8	22 7	22 7	22 7	22 7	22 7
7	23 0	22 56	22 51	22 46	22 43	22 39	22 35	22 31	22 29	22 26	22 24	22 21	22 18
8	23 51	23 43	23 34	23 24	23 19	23 12	23 5	22 56	22 52	22 47	22 42	22 37	22 31
9	....	....	....	....	23 58	23 49	23 38	23 25	23 19	23 12	23 5	22 56	22 47
10	0 45	0 33	0 20	0 6	....	....	....	....	23 52	23 43	23 33	23 22	23 9
11	1 41	1 26	1 10	0 53	0 42	0 30	0 16	0 0	....	....	....	23 58	23 42
12	2 39	2 22	2 5	1 44	1 32	1 17	1 3	0 43	0 34	0 23	0 11	....	....
13	3 38	3 21	3 2	2 41	2 29	2 14	1 58	1 36	1 26	1 15	1 3	0 48	0 30
14	4 37	4 21	4 3	3 42	3 30	3 16	3 0	2 40	2 30	2 19	2 7	1 53	1 36
15	5 34	5 19	5 3	4 45	4 34	4 22	4 8	3 50	3 42	3 32	3 22	3 10	2 56
16	6 28	6 16	6 2	5 48	5 39	5 29	5 17	5 3	4 56	4 49	4 41	4 31	4 21
17	7 18	7 9	6 59	6 49	6 42	6 35	6 26	6 16	6 12	6 6	6 0	5 54	5 46
18	8 5	8 0	7 54	7 47	7 43	7 39	7 34	7 28	7 25	7 22	7 18	7 14	7 10
19	8 50	8 48	8 46	8 43	8 42	8 40	8 39	8 37	8 36	8 35	8 34	8 32	8 31
20	9 33	9 34	9 36	9 38	9 39	9 40	9 42	9 44	9 45	9 46	9 47	9 48	9 49
21	10 15	10 20	10 26	10 32	10 35	10 39	10 44	10 50	10 52	10 55	10 58	11 2	11 6
22	10 58	11 6	11 15	11 25	11 31	11 37	11 45	11 54	11 59	12 4	12 9	12 15	12 22
23	11 41	11 52	12 4	12 18	12 26	12 35	12 46	12 59	13 5	13 12	13 19	13 28	13 38
24	12 26	12 40	12 55	13 11	13 22	13 33	13 46	14 2	14 10	14 19	14 28	14 39	14 52
25	13 14	13 29	13 46	14 6	14 17	14 30	14 45	15 4	15 13	15 24	15 35	15 48	16 4
26	14 3	14 20	14 38	14 59	15 11	15 25	15 42	16 3	16 12	16 24	16 36	16 51	17 8
27	14 54	15 11	15 30	15 51	16 4	16 18	16 35	16 56	17 6	17 17	17 30	17 45	18 2
28	15 47	16 3	16 21	16 41	16 53	17 7	17 23	17 42	17 52	18 2	18 14	18 28	18 44
29	16 40	16 54	17 10	17 28	17 39	17 51	18 5	18 22	18 30	18 39	18 49	19 0	19 14
30	17 32	17 44	17 57	18 12	18 21	18 30	18 42	18 55	19 2	19 9	19 17	19 25	19 35
31	18 24	18 33	18 42	18 53	18 59	19 6	19 15	19 24	19 29	19 34	19 39	19 45	19 52
Feb. 1	19 14	19 20	19 26	19 32	19 35	19 39	19 44	19 50	19 52	19 55	19 58	20 1	20 5
2	20 6	20 7	20 8	20 9	20 10	20 11	20 12	20 14	20 14	20 15	20 15	20 16	20 17
3	20 57	20 54	20 50	20 47	20 45	20 43	20 40	20 37	20 36	20 34	20 32	20 30	20 28
4	21 48	21 42	21 34	21 26	21 21	21 15	21 9	21 2	20 58	20 55	20 50	20 46	20 41
5	22 42	22 31	22 20	22 7	22 0	21 51	21 41	21 30	21 24	21 18	21 12	21 4	20 56
6	23 37	23 23	23 8	22 52	22 42	22 31	22 18	22 2	21 55	21 47	21 38	21 28	21 17
7	....	....	....	23 41	23 30	23 17	23 1	22 43	22 34	22 24	22 13	22 0	21 46
8	0 34	0 18	0 1	....	....	....	23 52	23 32	23 22	23 11	22 58	22 44	22 27
9	1 32	1 14	0 56	0 35	0 23	0 9	....	....	....	....	23 57	23 42	23 25
10	2 29	2 12	1 54	1 33	1 21	1 7	0 50	0 30	0 20	0 9	....	....	....
11	3 25	3 10	2 53	2 34	2 22	2 10	1 54	1 36	1 27	1 17	1 6	0 53	0 37
12	4 19	4 6	3 51	3 35	3 25	3 15	3 2	2 46	2 39	2 30	2 21	2 11	1 59
13	5 10	4 59	4 48	4 35	4 28	4 20	4 10	3 58	3 52	3 46	3 39	3 32	3 23
14	5 57	5 50	5 43	5 34	5 29	5 24	5 17	5 9	5 5	5 1	4 57	4 52	4 46
15	6 43	6 39	6 36	6 31	6 29	6 26	6 23	6 19	6 17	6 15	6 13	6 11	6 8
16	7 27	7 27	7 27	7 27	7 27	7 27	7 27	7 27	7 27	7 27	7 27	7 27	7 27

TABLE X.

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 704.

For other longitudes and for southern latitudes see page 738.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan. 1	5 31	5 14	4 56	4 36	4 24	4 10	3 53	3 33	3 23	3 12	3 0	2 45	2 28
2	6 24	6 8	5 52	5 34	5 23	5 11	4 56	4 38	4 30	4 20	4 10	3 57	3 43
3	7 15	7 3	6 50	6 34	6 25	6 15	6 3	5 49	5 42	5 34	5 26	5 16	5 5
4	8 6	7 57	7 47	7 36	7 29	7 22	7 13	7 2	6 58	6 52	6 46	6 39	6 32
5	8 56	8 50	8 44	8 38	8 34	8 29	8 24	8 18	8 15	8 12	8 8	8 4	8 0
6	9 45	9 43	9 42	9 40	9 38	9 37	9 36	9 34	9 33	9 32	9 31	9 30	9 29
7	10 34	10 36	10 39	10 42	10 44	10 46	10 48	10 50	10 52	10 53	10 55	10 56	10 58
8	11 24	11 31	11 38	11 45	11 50	11 55	12 1	12 8	12 11	12 15	12 19	12 23	12 28
9	12 16	12 27	12 38	12 50	12 57	13 5	13 14	13 26	13 32	13 38	13 44	13 52	14 0
10	13 11	13 24	13 39	13 55	14 5	14 16	14 29	14 44	14 52	15 0	15 9	15 20	15 32
11	14 8	14 24	14 41	15 1	15 12	15 25	15 41	16 0	16 9	16 19	16 30	16 44	16 59
12	15 7	15 24	15 43	16 4	16 16	16 31	16 48	17 8	17 18	17 30	17 42	17 57	18 15
13	16 7	16 24	16 42	17 3	17 16	17 30	17 47	18 7	18 17	18 28	18 41	18 55	19 12
14	17 5	17 21	17 38	17 57	18 9	18 22	18 37	18 56	19 4	19 14	19 25	19 38	19 53
15	18 0	18 14	18 28	18 45	18 55	19 6	19 18	19 34	19 41	19 49	19 58	20 8	20 20
16	18 52	19 3	19 14	19 27	19 34	19 43	19 53	20 4	20 10	20 16	20 22	20 29	20 38
17	19 41	19 48	19 56	20 5	20 10	20 15	20 22	20 30	20 33	20 37	20 41	20 46	20 52
18	20 27	20 31	20 34	20 39	20 42	20 44	20 48	20 51	20 53	20 55	20 57	21 0	21 2
19	21 11	21 11	21 11	21 11	21 11	21 11	21 12	21 12	21 12	21 12	21 12	21 12	21 12
20	21 53	21 50	21 47	21 43	21 40	21 38	21 35	21 31	21 30	21 28	21 26	21 24	21 21
21	22 36	22 29	22 22	22 14	22 10	22 4	21 58	21 51	21 48	21 44	21 40	21 36	21 31
22	23 19	23 9	22 59	22 47	22 40	22 33	22 24	22 13	22 8	22 3	21 57	21 50	21 42
23	....	23 51	23 38	23 22	23 14	23 4	22 52	22 38	22 31	22 24	22 16	22 7	21 56
24	0 3	....	....	....	23 50	23 38	23 24	23 7	22 59	22 50	22 40	22 29	22 15
25	0 49	0 35	0 19	0 1	....	....	.....	23 43	23 34	23 23	23 11	22 58	22 42
26	1 37	1 21	1 4	0 43	0 32	0 18	0 2	....	....	....	23 52	23 38	23 20
27	2 28	2 10	1 52	1 31	1 18	1 4	0 47	0 26	0 16	0 5	....	....	....
28	3 20	3 2	2 44	2 23	2 11	1 57	1 40	1 19	1 9	0 58	0 46	0 31	0 13
29	4 12	3 56	3 40	3 20	3 9	2 56	2 40	2 21	2 12	2 2	1 50	1 36	1 21
30	5 5	4 52	4 37	4 20	4 10	3 59	3 46	3 29	3 22	3 13	3 4	2 53	2 40
31	5 57	5 47	5 35	5 22	5 15	5 6	4 56	4 44	4 38	4 31	4 24	4 16	4 7
Feb. 1	6 49	6 42	6 34	6 25	6 20	6 15	6 8	6 0	5 56	5 54	5 48	5 42	5 36
2	7 39	7 36	7 33	7 29	7 27	7 24	7 21	7 18	7 16	7 15	7 12	7 10	7 8
3	8 30	8 31	8 32	8 33	8 34	8 35	8 35	8 36	8 37	8 37	8 38	8 39	8 39
4	9 21	9 26	9 32	9 38	9 41	9 45	9 50	9 55	9 58	10 1	10 4	10 8	10 11
5	10 14	10 22	10 32	10 43	10 49	10 56	11 4	11 14	11 19	11 25	11 30	11 37	11 44
6	11 7	11 20	11 33	11 48	11 57	12 7	12 19	12 33	12 40	12 47	12 56	13 5	13 16
7	12 4	12 19	12 35	12 53	13 4	13 16	13 31	13 49	13 58	14 7	14 18	14 30	14 44
8	13 1	13 18	13 36	13 56	14 8	14 22	14 39	14 59	15 9	15 19	15 32	15 46	16 3
9	13 59	14 16	14 35	14 56	15 8	15 22	15 39	16 0	16 10	16 21	16 34	16 48	17 5
10	14 56	15 13	15 30	15 50	16 2	16 15	16 31	16 51	17 0	17 10	17 22	17 35	17 51
11	15 51	16 6	16 21	16 39	16 49	17 1	17 15	17 32	17 39	17 48	17 58	18 9	18 22
12	16 44	16 56	17 8	17 22	17 31	17 40	17 51	18 4	18 11	18 17	18 25	18 33	18 43
13	17 33	17 42	17 51	18 1	18 7	18 14	18 22	18 32	18 36	18 41	18 46	18 52	18 59
14	18 20	18 25	18 30	18 37	18 41	18 45	18 49	18 55	18 58	19 0	19 4	19 7	19 11
15	19 4	19 6	19 8	19 10	19 12	19 13	19 14	19 16	19 17	19 18	19 19	19 20	19 21
16	19 48	19 46	19 44	19 42	19 41	19 39	19 38	19 36	19 35	19 34	19 33	19 32	19 31
17	20 30	20 25	20 20	20 14	20 10	20 6	20 2	19 56	19 54	19 51	19 48	19 44	19 41

TABLE X.

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 704.

For other longitudes and for southern latitudes see page 738.

Lat. Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Feb. 16	7 27	7 27	7 27	7 27	7 27	7 27	7 27	7 27	7 27	7 27	7 27	7 27	7 27
17	8 10	8 13	8 17	8 21	8 24	8 26	8 30	8 33	8 35	8 37	8 39	8 42	8 44
18	8 52	8 59	9 6	9 15	9 20	9 25	9 31	9 39	9 43	9 46	9 51	9 56	10 1
19	9 36	9 46	9 56	10 8	10 15	10 23	10 32	10 44	10 49	10 55	11 1	11 9	11 17
20	10 20	10 33	10 46	11 2	11 10	11 21	11 33	11 48	11 54	12 2	12 11	12 20	12 32
21	11 6	11 21	11 37	11 55	12 6	12 18	12 32	12 50	12 58	13 8	13 18	13 30	13 44
22	11 54	12 10	12 28	12 48	13 0	13 13	13 29	13 49	13 58	14 9	14 21	14 35	14 51
23	12 44	13 1	13 19	13 40	13 52	14 6	14 23	14 44	14 54	15 5	15 17	15 32	15 50
24	13 35	13 51	14 9	14 30	14 42	14 56	15 12	15 33	15 42	15 53	16 5	16 19	16 36
25	14 27	14 42	14 59	15 18	15 29	15 42	15 56	16 15	16 23	16 33	16 44	16 56	17 11
26	15 19	15 32	15 46	16 2	16 12	16 23	16 36	16 51	16 58	17 6	17 15	17 25	17 36
27	16 11	16 20	16 32	16 45	16 52	17 1	17 11	17 22	17 28	17 34	17 40	17 47	17 56
28	17 3	17 10	17 17	17 25	17 30	17 36	17 42	17 49	17 53	17 56	18 1	18 5	18 11
Mar. 1	17 54	17 58	18 1	18 4	18 6	18 9	18 12	18 15	18 16	18 18	18 19	18 22	18 24
2	18 47	18 46	18 44	18 43	18 42	18 41	18 40	18 39	18 39	18 38	18 38	18 37	18 36
3	19 40	19 34	19 29	19 22	19 19	19 15	19 10	19 5	19 2	18 59	18 56	18 53	18 49
4	20 34	20 25	20 15	20 4	19 58	19 51	19 42	19 32	19 28	19 23	19 18	19 11	19 4
5	21 30	21 18	21 5	20 49	20 40	20 30	20 19	20 5	19 58	19 51	19 43	19 34	19 24
6	22 28	22 13	21 57	21 38	21 28	21 15	21 1	20 43	20 35	20 26	20 16	20 4	19 51
7	23 27	23 10	22 52	22 32	22 20	22 6	21 50	21 30	21 21	21 10	20 58	20 45	20 28
8	....	....	23 50	23 29	23 17	23 3	22 46	22 26	22 16	22 5	21 53	21 39	21 22
9	0 25	0 8	....	....	....	....	23 48	23 29	23 20	23 10	22 59	22 45	22 30
10	1 21	1 5	0 48	0 28	0 17	0 4	....	....	....	....	....	....	23 47
11	2 15	2 1	1 46	1 29	1 19	1 7	0 54	0 37	0 30	0 21	0 11	0 0	....
12	3 6	2 54	2 42	2 28	2 20	2 11	2 0	1 47	1 41	1 34	1 27	1 18	1 9
13	3 53	3 45	3 36	3 27	3 21	3 14	3 7	2 57	2 53	2 49	2 43	2 37	2 31
14	4 39	4 34	4 29	4 23	4 20	4 16	4 12	4 6	4 4	4 1	3 58	3 55	3 51
15	5 23	5 22	5 20	5 18	5 18	5 16	5 16	5 14	5 13	5 13	5 12	5 11	5 10
16	6 6	6 8	6 10	6 13	6 14	6 16	6 18	6 20	6 22	6 23	6 24	6 26	6 27
17	6 48	6 54	7 0	7 6	7 10	7 15	7 20	7 26	7 29	7 32	7 35	7 39	7 44
18	7 32	7 40	7 49	8 0	8 6	8 13	8 21	8 31	8 35	8 40	8 46	8 52	8 59
19	8 16	8 27	8 40	8 53	9 2	9 11	9 22	9 35	9 41	9 48	9 56	10 4	10 14
20	9 1	9 15	9 30	9 47	9 57	10 8	10 21	10 38	10 45	10 54	11 4	11 15	11 27
21	9 48	10 4	10 20	10 40	10 51	11 4	11 19	11 38	11 46	11 56	12 8	12 21	12 36
22	10 36	10 53	11 11	11 31	11 43	11 57	12 13	12 34	12 43	12 54	13 6	13 20	13 37
23	11 26	11 43	12 1	12 21	12 33	12 47	13 4	13 24	13 34	13 44	13 56	14 11	14 27
24	12 16	12 32	12 49	13 9	13 20	13 34	13 49	14 8	14 17	14 27	14 38	14 51	15 6
25	13 7	13 21	13 38	13 54	14 4	14 16	14 29	14 46	14 53	15 2	15 12	15 22	15 35
26	13 58	14 10	14 22	14 36	14 45	14 54	15 5	15 18	15 24	15 31	15 39	15 47	15 57
27	14 49	14 57	15 6	15 17	15 23	15 30	15 37	15 47	15 51	15 56	16 1	16 7	16 14
28	15 40	15 44	15 50	15 56	15 59	16 3	16 8	16 13	16 15	16 18	16 21	16 24	16 28
29	16 31	16 32	16 33	16 34	16 35	16 36	16 37	16 38	16 38	16 39	16 40	16 40	16 41
30	17 24	17 21	17 18	17 14	17 12	17 9	17 7	17 3	17 2	17 0	16 58	16 56	16 54
31	18 19	18 12	18 4	17 56	17 51	17 45	17 39	17 31	17 27	17 23	17 19	17 15	17 9
Apr. 1	19 16	19 5	18 54	18 41	18 33	18 24	18 14	18 2	17 57	17 50	17 44	17 36	17 28
2	20 16	20 2	19 47	19 30	19 20	19 8	18 55	18 39	18 32	18 24	18 14	18 4	17 53
3	21 16	21 0	20 43	20 24	20 12	19 59	19 44	19 25	19 16	19 6	18 55	18 42	18 27

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET, MERIDIAN OF GREENWICH, 1919.

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To obtain standard time, see directions on page 704.

For other longitudes and for southern latitudes see page 738.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Feb. 16	19 48	19 46	19 44	19 42	19 41	19 39	19 38	19 36	19 35	19 34	19 33	19 32	19 31
17	20 30	20 25	20 20	20 14	20 10	20 6	20 2	19 56	19 54	19 51	19 48	19 44	19 41
18	21 13	21 5	20 56	20 46	20 41	20 34	20 26	20 17	20 13	20 8	20 3	19 58	19 52
19	21 57	21 46	21 34	21 21	21 13	21 4	20 54	20 41	20 35	20 29	20 22	20 14	20 5
20	22 42	22 29	22 14	21 58	21 48	21 37	21 24	21 8	21 1	20 53	20 44	20 34	20 22
21	23 29	23 14	22 57	22 38	22 27	22 14	21 59	21 41	21 32	21 23	21 12	20 59	20 45
22	....	....	23 43	23 23	23 11	22 57	22 40	22 20	22 11	22 0	21 48	21 34	21 17
23	0 18	0 1	....	....	....	23 46	23 29	23 8	22 58	22 47	22 34	22 20	22 2
24	1 8	0 51	0 33	0 12	0 0	....	....	....	23 55	23 44	23 32	23 18	23 2
25	2 0	1 43	1 26	1 6	0 54	0 40	0 24	0 4	....	....	....	....	....
26	2 52	2 37	2 21	2 3	1 53	1 41	1 26	1 9	1 0	0 51	0 40	0 29	0 15
27	3 44	3 32	3 19	3 4	2 55	2 45	2 34	2 20	2 13	2 6	1 57	1 48	1 37
28	4 36	4 27	4 17	4 7	4 0	3 53	3 45	3 34	3 30	3 24	3 19	3 12	3 5
Mar. 1	5 27	5 22	5 17	5 11	5 7	5 3	4 58	4 53	4 50	4 47	4 44	4 40	4 36
2	6 19	6 18	6 17	6 16	6 15	6 14	6 13	6 12	6 12	6 11	6 10	6 10	6 9
3	7 12	7 15	7 18	7 22	7 24	7 27	7 30	7 33	7 35	7 37	7 39	7 41	7 43
4	8 5	8 12	8 20	8 29	8 34	8 40	8 47	8 55	8 59	9 3	9 8	9 13	9 19
5	9 1	9 12	9 24	9 37	9 45	9 54	10 4	10 17	10 23	10 29	10 37	10 45	10 54
6	9 58	10 12	10 27	10 44	10 54	11 6	11 19	11 36	11 44	11 53	12 2	12 14	12 27
7	10 56	11 12	11 29	11 49	12 1	12 14	12 30	12 49	12 58	13 9	13 20	13 34	13 50
8	11 53	12 12	12 30	12 51	13 3	13 17	13 33	13 54	14 4	14 15	14 27	14 42	14 58
9	12 52	13 8	13 26	13 47	13 58	14 12	14 28	14 48	14 57	15 8	15 20	15 33	15 49
10	13 47	14 2	14 18	14 36	14 47	14 59	15 14	15 31	15 39	15 48	15 58	16 10	16 24
11	14 40	14 52	15 6	15 21	15 30	15 40	15 52	16 6	16 13	16 20	16 28	16 37	16 48
12	15 29	15 39	15 49	16 1	16 8	16 15	16 24	16 35	16 40	16 45	16 51	16 58	17 5
13	16 16	16 22	16 29	16 37	16 41	16 46	16 52	16 59	17 2	17 6	17 10	17 14	17 19
14	17 0	17 4	17 7	17 10	17 12	17 15	17 18	17 21	17 22	17 24	17 25	17 27	17 30
15	17 44	17 43	17 43	17 43	17 42	17 42	17 42	17 41	17 41	17 41	17 40	17 40	17 40
16	18 27	18 23	18 19	18 14	18 12	18 9	18 6	18 1	18 0	17 57	17 55	17 53	17 50
17	19 10	19 3	18 55	18 47	18 42	18 36	18 30	18 22	18 19	18 15	18 11	18 6	18 1
18	19 53	19 43	19 32	19 20	19 13	19 6	18 56	18 45	18 40	18 34	18 28	18 21	18 14
19	20 38	20 25	20 12	19 57	19 48	19 38	19 26	19 12	19 5	18 57	18 49	18 40	18 29
20	21 24	21 9	20 54	20 36	20 25	20 13	19 59	19 42	19 34	19 25	19 15	19 4	18 50
21	22 12	21 55	21 38	21 18	21 7	20 53	20 38	20 19	20 9	19 59	19 47	19 34	19 19
22	23 0	22 44	22 26	22 5	21 53	21 39	21 22	21 2	20 52	20 42	20 29	20 15	19 58
23	23 50	23 34	23 16	22 56	22 44	22 30	22 14	21 54	21 44	21 34	21 21	21 7	20 51
24	....	....	....	23 50	23 39	23 27	23 12	22 53	22 44	22 35	22 24	22 11	21 56
25	0 41	0 26	0 9	....	....	....	....	23 50	23 52	23 44	23 34	23 24	23 12
26	1 32	1 18	1 4	0 48	0 38	0 28	0 15	....	....	....	....	....	....
27	2 22	2 12	2 0	1 48	1 41	1 32	1 22	1 10	1 5	0 58	0 51	0 44	0 35
28	3 13	3 6	2 59	2 50	2 45	2 40	2 33	2 25	2 22	2 18	2 13	2 8	2 2
29	4 4	4 1	3 58	3 54	3 52	3 49	3 47	3 43	3 42	3 40	3 38	3 36	3 33
30	4 56	4 57	4 58	5 0	5 1	5 1	5 2	5 3	5 4	5 4	5 5	5 6	5 6
31	5 50	5 55	6 1	6 7	6 11	6 15	6 20	6 26	6 28	6 32	6 34	6 38	6 42
Apr. 1	6 46	6 55	7 5	7 16	7 28	7 30	7 39	7 50	7 54	8 0	8 6	8 12	8 20
2	7 44	7 57	8 10	8 26	8 35	8 45	8 58	9 12	9 19	9 27	9 36	9 48	[illegible]
3	8 44	9 0	9 16	9 35	9 46	9 58	10 13	10 31	10 40	10 50	11 1	11 13	[illegible]

TABLE X.

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 704.

For other longitudes and for southern latitudes see page 738.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr. 1	19 16	19 5	18 54	18 41	18 33	18 24	18 14	18 2	17 57	17 50	17 44	17 36	17 28
2	20 16	20 2	19 47	19 30	19 20	19 8	18 55	18 39	18 32	18 24	18 14	18 4	17 52
3	21 16	21 0	20 43	20 24	20 12	19 59	19 44	19 25	19 16	19 6	18 55	18 42	18 27
4	22 17	22 0	21 42	21 21	21 9	20 56	20 39	20 19	20 9	19 59	19 47	19 32	19 16
5	23 15	22 59	22 42	22 22	22 10	21 57	21 41	21 22	21 13	21 2	20 51	20 37	20 21
6	....	23 56	23 41	23 23	23 13	23 1	22 47	22 30	22 22	22 13	22 2	21 51	21 37
7	0 11	....	....	....	....	....	23 54	23 40	23 33	23 26	23 18	23 9	22 58
8	1 3	0 51	0 38	0 23	0 15	0 5	....	....	....	....	....	....	....
9	1 52	1 42	1 33	1 22	1 16	1 8	1 0	0 50	0 45	0 39	0 34	0 27	0 20
10	2 38	2 32	2 26	2 18	2 14	2 10	2 5	1 58	1 55	1 52	1 48	1 44	1 40
11	3 21	3 19	3 16	3 14	3 12	3 10	3 8	3 5	3 4	3 3	3 2	3 0	2 58
12	4 4	4 5	4 6	4 8	4 8	4 9	4 10	4 11	4 12	4 13	4 13	4 14	4 15
13	4 47	4 51	4 56	5 1	5 4	5 8	5 12	5 16	5 19	5 21	5 24	5 27	5 30
14	5 29	5 37	5 45	5 54	5 59	6 5	6 12	6 21	6 25	6 29	6 34	6 40	6 46
15	6 13	6 24	6 35	6 47	6 55	7 3	7 13	7 25	7 31	7 37	7 44	7 52	8 0
16	6 58	7 11	7 25	7 41	7 50	8 0	8 13	8 28	8 36	8 44	8 53	9 3	9 14
17	7 44	7 59	8 15	8 34	8 44	8 57	9 11	9 29	9 38	9 47	9 58	10 10	10 24
18	8 32	8 48	9 6	9 26	9 37	9 51	10 7	10 27	10 36	10 46	10 58	11 12	11 28
19	9 21	9 38	9 56	10 16	10 28	10 42	10 58	11 18	11 28	11 39	11 51	12 5	12 22
20	10 11	10 27	10 44	11 4	11 16	11 29	11 44	12 4	12 13	12 23	12 35	12 48	13 4
21	11 0	11 15	11 31	11 49	12 0	12 12	12 26	12 43	12 51	13 0	13 11	13 22	13 36
22	11 50	12 2	12 16	12 31	12 40	12 50	13 2	13 17	13 23	13 31	13 39	13 48	13 59
23	12 39	12 49	12 59	13 11	13 18	13 26	13 35	13 46	13 51	13 57	14 3	14 10	14 17
24	13 28	13 34	13 41	13 49	13 54	13 59	14 5	14 12	14 16	14 19	14 23	14 27	14 32
25	14 18	14 20	14 24	14 27	14 29	14 31	14 34	14 37	14 38	14 40	14 42	14 43	14 46
26	15 9	15 8	15 6	15 5	15 4	15 3	15 3	15 1	15 1	15 0	15 0	14 59	14 58
27	16 2	15 57	15 51	15 45	15 41	15 37	15 33	15 27	15 25	15 22	15 19	15 16	15 12
28	16 57	16 48	16 39	16 28	16 22	16 14	16 6	15 56	15 52	15 47	15 42	15 36	15 29
29	17 56	17 44	17 30	17 15	17 7	16 56	16 45	16 31	16 24	16 17	16 9	16 0	15 50
30	18 58	18 43	18 26	18 8	17 57	17 45	17 31	17 13	17 5	16 56	16 46	16 34	16 20
May 1	20 0	19 44	19 26	19 6	18 54	18 41	18 25	18 5	17 56	17 46	17 34	17 20	17 4
2	21 2	20 46	20 28	20 8	19 56	19 42	19 26	19 6	18 57	18 47	18 34	18 21	18 4
3	22 1	21 46	21 30	21 11	21 0	20 48	20 33	20 15	20 6	19 57	19 46	19 34	19 19
4	22 56	22 44	22 30	22 14	22 5	21 54	21 42	21 27	21 20	21 12	21 3	20 53	20 42
5	23 48	23 38	23 27	23 15	23 8	23 0	22 50	22 39	22 34	22 28	22 21	22 14	22 6
6	....	....	....	....	....	....	23 57	23 49	23 46	23 42	23 38	23 33	23 28
7	0 35	0 28	0 21	0 13	0 8	0 3	....	....	....	....	....	....	....
8	1 20	1 17	1 13	1 9	1 7	1 4	1 1	0 58	0 56	0 54	0 52	0 50	0 47
9	2 3	2 3	2 3	2 3	2 3	2 3	2 3	2 4	2 4	2 4	2 4	2 4	2 4
10	2 46	2 49	2 53	2 57	2 59	3 2	3 5	3 8	3 10	3 12	3 14	3 17	3 20
11	3 28	3 35	3 42	3 50	3 54	4 0	4 6	4 13	4 17	4 20	4 24	4 29	4 35
12	4 11	4 21	4 31	4 42	4 49	4 57	5 6	5 17	5 22	5 28	5 34	5 41	5 49
13	4 56	5 8	5 21	5 36	5 45	5 54	6 6	6 20	6 27	6 34	6 43	6 52	7 3
14	5 42	5 56	6 11	6 29	6 39	6 51	7 5	7 22	7 30	7 39	7 49	8 1	8 14
15	6 29	6 45	7 2	7 21	7 33	7 46	8 1	8 21	8 30	8 40	8 51	9 5	9 20
16	7 18	7 34	7 52	8 12	8 24	8 38	8 54	9 15	9 24	9 35	9 47	10 1	10 17
17	8 7	8 24	8 41	9 1	9 13	9 27	9 42	10 2	10 12	10 22	10 34	10 47	11 3

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET, MERIDIAN OF GREENWICH, 1919.

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Lat. / Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr. 1	6 46	6 55	7 5	7 16	7 23	7 30	7 39	7 50	7 54	8 0	8 6	8 12	8 20
2	7 44	7 57	8 10	8 26	8 35	8 45	8 58	9 12	9 19	9 27	9 36	9 46	9 57
3	8 44	9 0	9 16	9 35	9 46	9 58	10 13	10 31	10 40	10 50	11 1	11 13	11 28
4	9 45	10 2	10 20	10 40	10 52	11 6	11 22	11 42	11 52	12 2	12 14	12 28	12 45
5	10 45	11 2	11 19	11 40	11 52	12 5	12 22	12 42	12 51	13 2	13 14	13 27	13 43
6	11 42	11 57	12 14	12 33	12 44	12 57	13 11	13 29	13 38	13 47	13 58	14 10	14 24
7	12 36	12 50	13 4	13 20	13 29	13 40	13 52	14 7	14 14	14 22	14 31	14 41	14 52
8	13 27	13 37	13 48	14 1	14 8	14 17	14 26	14 38	14 43	14 49	14 56	15 3	15 11
9	14 14	14 21	14 29	14 38	14 43	14 49	14 56	15 4	15 7	15 11	15 16	15 21	15 26
10	14 59	15 3	15 7	15 12	15 15	15 18	15 22	15 26	15 28	15 30	15 32	15 35	15 38
11	15 42	15 43	15 44	15 44	15 45	15 45	15 46	15 47	15 47	15 47	15 48	15 48	15 48
12	16 25	16 22	16 19	16 16	16 14	16 12	16 10	16 7	16 5	16 4	16 2	16 1	15 58
13	17 7	17 2	16 55	16 48	16 44	16 39	16 34	16 28	16 24	16 21	16 18	16 14	16 9
14	17 51	17 42	17 32	17 21	17 15	17 8	17 0	16 50	16 45	16 40	16 35	16 28	16 22
15	18 35	18 23	18 11	17 56	17 48	17 39	17 28	17 15	17 9	17 2	16 54	16 46	16 36
16	19 20	19 7	18 52	18 35	18 25	18 13	18 0	17 44	17 37	17 28	17 19	17 8	16 56
17	20 7	19 52	19 35	19 16	19 5	18 52	18 37	18 19	18 10	18 0	17 49	17 37	17 22
18	20 56	20 39	20 22	20 2	19 50	19 36	19 20	19 0	18 50	18 40	18 28	18 14	17 58
19	21 45	21 29	21 11	20 51	20 39	20 25	20 9	19 49	19 39	19 28	19 16	19 2	18 46
20	22 35	22 19	22 2	21 43	21 32	21 19	21 3	20 45	20 36	20 26	20 14	20 1	19 46
21	23 24	23 10	22 55	22 38	22 28	22 17	22 3	21 47	21 39	21 30	21 20	21 9	20 56
22	....	....	23 50	23 36	23 27	23 18	23 7	22 54	22 47	22 41	22 33	22 24	22 14
23	0 13	0 2	....	....	....	....	....	....	....	23 55	23 50	23 44	23 37
24	1 2	0 54	0 45	0 35	0 29	0 22	0 14	0 5	0 0	....	....	....	....
25	1 52	1 47	1 42	1 36	1 32	1 28	1 24	1 19	1 16	1 13	1 10	1 7	1 3
26	2 42	2 41	2 40	2 39	2 38	2 37	2 36	2 35	2 34	2 34	2 33	2 32	2 32
27	3 33	3 36	3 40	3 44	3 46	3 48	3 51	3 54	3 56	3 58	4 0	4 2	4 4
28	4 28	4 34	4 42	4 51	4 56	5 2	5 8	5 17	5 20	5 25	5 29	5 34	5 40
29	5 25	5 36	5 48	6 1	6 8	6 18	6 28	6 40	6 46	6 53	7 0	7 8	7 18
30	6 25	6 39	6 54	7 11	7 21	7 33	7 46	8 3	8 11	8 20	8 29	8 40	8 54
May 1	7 27	7 43	8 1	8 20	8 32	8 45	9 1	9 20	9 29	9 40	9 51	10 4	10 20
2	8 30	8 46	9 4	9 25	9 37	9 51	10 7	10 27	10 37	10 47	10 59	11 13	11 30
3	9 31	9 47	10 4	10 23	10 35	10 48	11 3	11 22	11 31	11 40	11 52	12 4	12 19
4	10 28	10 42	10 57	11 14	11 24	11 36	11 49	12 5	12 12	12 21	12 30	12 41	12 53
5	11 23	11 33	11 45	11 59	12 7	12 16	12 26	12 39	12 45	12 52	12 59	13 7	13 16
6	12 11	12 19	12 28	12 38	12 44	12 50	12 58	13 7	13 11	13 16	13 21	13 26	13 32
7	12 57	13 2	13 8	13 14	13 17	13 21	13 26	13 31	13 33	13 36	13 39	13 42	13 46
8	13 41	13 43	13 45	13 47	13 48	13 49	13 50	13 52	13 53	13 53	13 54	13 56	13 57
9	14 24	14 22	14 20	14 18	14 17	14 16	14 14	14 12	14 12	14 11	14 10	14 8	14 7
10	15 7	15 1	14 56	14 50	14 47	14 43	14 38	14 33	14 30	14 28	14 25	14 22	14 18
11	15 49	15 41	15 32	15 23	15 17	15 11	15 3	14 55	14 51	14 46	14 41	14 36	14 30
12	16 33	16 22	16 10	15 57	15 50	15 41	15 31	15 19	15 13	15 7	15 0	14 52	14 44
13	17 18	17 5	16 50	16 34	16 25	16 14	16 2	15 46	15 39	15 32	15 23	15 13	15 1
14	18 5	17 50	17 33	17 15	17 4	16 51	16 37	16 19	16 11	16 2	15 51	15 39	15 25
15	18 53	18 36	18 19	17 59	17 48	17 34	17 18	16 59	16 49	16 39	16 27	16 14	15 58
16	19 42	19 25	19 8	18 47	18 35	18 22	18 5	17 45	17 36	17 25	17 12	16 58	16 42
17	20 31	20 15	19 58	19 39	19 27	19 14	18 58	18 39	18 30	18 20	18 8	17 54	17 39

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE, MERIDIAN OF GREENWICH, 1919.

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Lat. / Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
May 17	8 7	8 24	8 41	9 1	9 13	9 27	9 42	10 2	10 12	10 22	10 34	10 47	11 3
18	8 57	9 12	9 28	9 47	9 58	10 11	10 25	10 43	10 52	11 1	11 12	11 24	11 38
19	9 46	9 59	10 14	10 30	10 40	10 50	11 3	11 18	11 26	11 34	11 42	11 52	12 4
20	10 34	10 45	10 57	11 10	11 18	11 26	11 36	11 48	11 54	12 0	12 7	12 14	12 23
21	11 22	11 30	11 38	11 48	11 53	11 59	12 6	12 13	12 19	12 23	12 28	12 33	12 39
22	12 10	12 14	12 19	12 24	12 27	12 31	12 34	12 39	12 41	12 43	12 46	12 49	12 52
23	12 59	13 0	13 0	13 1	13 1	13 2	13 2	13 3	13 3	13 3	13 4	13 4	13 4
24	13 49	13 46	13 42	13 38	13 36	13 33	13 30	13 27	13 25	13 24	13 22	13 19	13 17
25	14 42	14 34	14 27	14 18	14 13	14 8	14 1	13 53	13 50	13 46	13 42	13 37	13 32
26	15 38	15 27	15 15	15 2	14 55	14 46	14 36	14 24	14 19	14 13	14 6	13 59	13 50
27	16 37	16 23	16 8	15 51	15 42	15 30	15 17	15 2	14 54	14 46	14 37	14 27	14 15
28	17 39	17 23	17 6	16 47	16 35	16 22	16 7	15 48	15 40	15 30	15 19	15 6	14 51
29	18 42	18 26	18 8	17 47	17 35	17 22	17 6	16 46	16 36	16 25	16 13	16 0	15 43
30	19 44	19 28	19 11	18 52	18 40	18 27	18 12	17 52	17 44	17 33	17 22	17 9	16 53
31	20 43	20 29	20 14	19 57	19 47	19 35	19 22	19 5	18 57	18 49	18 39	18 28	18 14
June 1	21 38	21 27	21 14	21 1	20 53	20 44	20 33	20 20	20 14	20 9	20 0	19 51	19 42
2	22 29	22 20	22 12	22 2	21 56	21 50	21 43	21 33	21 29	21 25	21 19	21 14	21 7
3	23 16	23 11	23 6	23 0	22 57	22 54	22 49	22 44	22 42	22 39	22 36	22 33	22 29
4	. . . .	23 59	23 58	23 57	23 56	23 55	23 54	23 53	23 52	23 51	23 51	23 50	23 49
5	0 0	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .
6	0 44	0 46	0 48	0 51	0 52	0 54	0 56	0 59	1 0	1 1	1 3	1 4	1 6
7	1 26	1 32	1 38	1 44	1 48	1 52	1 58	2 4	2 7	2 10	2 14	2 17	2 22
8	2 9	2 18	2 27	2 37	2 43	2 50	2 58	3 8	3 13	3 18	3 23	3 30	3 37
9	2 53	3 4	3 16	3 30	3 38	3 48	3 58	4 12	4 18	4 25	4 32	4 41	4 51
10	3 38	3 52	4 7	4 24	4 33	4 44	4 58	5 14	5 22	5 30	5 40	5 51	6 3
11	4 25	4 41	4 57	5 16	5 27	5 40	5 55	6 14	6 23	6 33	6 44	6 57	7 12
12	5 14	5 30	5 48	6 8	6 20	6 34	6 50	7 10	7 19	7 30	7 42	7 56	8 12
13	6 4	6 20	6 38	6 58	7 10	7 24	7 40	8 0	8 10	8 20	8 32	8 46	9 2
14	6 54	7 9	7 26	7 46	7 57	8 10	8 25	8 44	8 52	9 2	9 14	9 26	9 41
15	7 43	7 57	8 12	8 30	8 40	8 51	9 4	9 21	9 28	9 37	9 46	9 57	10 9
16	8 32	8 44	8 56	9 11	9 19	9 28	9 39	9 52	9 59	10 5	10 13	10 21	10 31
17	9 20	9 29	9 38	9 49	9 55	10 2	10 10	10 20	10 24	10 29	10 34	10 41	10 47
18	10 8	10 13	10 19	10 26	10 29	10 34	10 39	10 44	10 47	10 50	10 53	10 57	11 1
19	10 55	10 57	10 59	11 1	11 3	11 4	11 6	11 8	11 9	11 10	11 11	11 12	11 13
20	11 44	11 42	11 40	11 37	11 36	11 35	11 33	11 31	11 30	11 29	11 28	11 26	11 25
21	12 34	12 28	12 22	12 15	12 11	12 7	12 2	11 56	11 53	11 50	11 46	11 43	11 38
22	13 26	13 17	13 7	12 56	12 49	12 42	12 33	12 23	12 18	12 13	12 8	12 1	11 54
23	14 22	14 10	13 56	13 41	13 32	13 22	13 10	12 56	12 50	12 43	12 34	12 25	12 15
24	15 21	15 6	14 50	14 32	14 21	14 9	13 54	13 37	13 29	13 20	13 9	12 57	12 44
25	16 23	16 6	15 49	15 28	15 17	15 3	14 47	14 28	14 18	14 8	13 56	13 42	13 26
26	17 25	17 8	16 51	16 30	16 19	16 5	15 49	15 29	15 20	15 9	14 57	14 43	14 27
27	18 26	18 11	17 54	17 36	17 25	17 12	16 58	16 40	16 31	16 22	16 11	15 58	15 44
28	19 23	19 11	18 57	18 41	18 32	18 22	18 10	17 55	17 48	17 40	17 31	17 21	17 10
29	20 17	20 7	19 57	19 45	19 38	19 31	19 22	19 10	19 5	19 0	18 53	18 46	18 38
30	21 7	21 1	20 54	20 47	20 42	20 37	20 31	20 24	20 21	20 18	20 14	20 9	20 4
July 1	21 54	21 51	21 48	21 45	21 43	21 41	21 38	21 36	21 34	21 33	21 31	21 29	21 27
2	22 39	22 40	22 40	22 41	22 42	22 42	22 43	22 44	22 45	22 45	22 46	22 46	22 47

TABLE X.

OCAL ASTRONOMICAL MEAN TIME OF MOONSET, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; f greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one o the day.

To obtain standard time, see directions on page 704.

For other longitudes and for southern latitudes see page 738.

Lat. ate.		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
lay	17	20 31	20 15	19 58	19 39	19 27	19 14	18 58	18 39	18 30	18 20	18 8	17 54	17 39
	18	21 21	21 6	20 51	20 33	20 22	20 10	19 56	19 39	19 31	19 22	19 11	19 0	18 46
	19	22 10	21 57	21 44	21 29	21 20	21 10	20 58	20 44	20 37	20 30	20 21	20 12	20 1
	20	22 58	22 48	22 38	22 27	22 20	22 12	22 3	21 52	21 47	21 42	21 36	21 28	21 21
	21	23 45	23 39	23 33	23 25	23 21	23 16	23 10	23 3	23 0	22 56	22 52	22 48	22 43
	22	....	....	....	....	....	....	....	....	....	....	....	....	....
	23	0 33	0 31	0 28	0 25	0 23	0 21	0 19	0 16	0 15	0 14	0 12	0 10	0 8
	24	1 22	1 24	1 26	1 27	1 28	1 29	1 30	1 32	1 32	1 33	1 34	1 35	1 36
	25	2 14	2 19	2 24	2 31	2 35	2 39	2 44	2 50	2 52	2 56	2 59	3 2	3 6
	26	3 8	3 17	3 27	3 38	3 44	3 51	4 0	4 10	4 15	4 20	4 26	4 33	4 41
	27	4 5	4 18	4 31	4 47	4 56	5 6	5 18	5 32	5 39	5 47	5 56	6 5	6 16
	28	5 6	5 21	5 36	5 56	6 7	6 19	6 34	6 52	7 1	7 10	7 21	7 34	7 48
	29	6 9	6 26	6 43	7 4	7 16	7 29	7 45	8 5	8 15	8 25	8 37	8 51	9 8
	30	7 12	7 29	7 46	8 6	8 18	8 32	8 48	9 7	9 17	9 27	9 39	9 52	10 8
	31	8 13	8 28	8 44	9 2	9 13	9 25	9 40	9 57	10 6	10 14	10 25	10 37	10 50
une	1	9 10	9 22	9 36	9 51	10 0	10 10	10 22	10 37	10 43	10 50	10 59	11 8	11 18
	2	10 3	10 12	10 23	10 34	10 41	10 49	10 57	11 8	11 13	11 18	11 24	11 31	11 38
	3	10 52	10 58	11 5	11 12	11 17	11 22	11 27	11 34	11 37	11 41	11 45	11 49	11 53
	4	11 38	11 40	11 44	11 47	11 49	11 51	11 54	11 57	11 58	12 0	12 2	12 4	12 6
	5	12 22	12 21	12 20	12 20	12 19	12 19	12 18	12 18	12 17	12 17	12 16	12 16	12 16
	6	13 4	13 0	12 56	12 52	12 49	12 46	12 42	12 38	12 36	12 34	12 32	12 29	12 26
	7	13 47	13 40	13 33	13 24	13 19	13 14	13 7	13 0	12 56	12 52	12 48	12 43	12 38
	8	14 30	14 20	14 10	13 58	13 51	13 43	13 34	13 22	13 17	13 12	13 6	12 59	12 51
	9	15 15	15 2	14 49	14 34	14 25	14 15	14 3	13 49	13 42	13 35	13 27	13 18	13 7
	10	16 1	15 47	15 31	15 13	15 3	14 51	14 37	14 20	14 12	14 3	13 53	13 42	13 29
	11	16 49	16 33	16 16	15 56	15 45	15 32	15 16	14 57	14 48	14 38	14 27	14 14	13 58
	12	17 38	17 22	17 4	16 44	16 31	16 18	16 1	15 41	15 32	15 21	15 9	14 55	14 38
	13	18 28	18 12	17 54	17 34	17 22	17 9	16 53	16 33	16 24	16 13	16 1	15 47	15 31
	14	19 18	19 3	18 47	18 28	18 17	18 5	17 50	17 32	17 23	17 14	17 3	16 50	16 36
	15	20 7	19 54	19 40	19 24	19 15	19 4	18 51	18 36	18 29	18 21	18 12	18 1	17 49
	16	20 56	20 45	20 34	20 21	20 14	20 6	19 56	19 44	19 38	19 32	19 25	19 17	19 8
	17	21 43	21 36	21 28	21 20	21 14	21 9	21 2	20 54	20 50	20 46	20 41	20 36	20 30
	18	22 31	22 27	22 23	22 18	22 16	22 13	22 9	22 5	22 3	22 1	21 59	21 56	21 53
	19	23 18	23 18	23 18	23 18	23 18	23 18	23 18	23 18	23 18	23 18	23 18	23 18	23 18
	20	....	....	....	....	....	....	....	....	....	....	....	....	....
	21	0 7	0 11	0 15	0 20	0 22	0 25	0 29	0 33	0 35	0 37	0 40	0 42	0 45
	22	0 58	1 6	1 14	1 23	1 29	1 34	1 42	1 50	1 54	1 58	2 3	2 8	2 15
	23	1 52	2 3	2 15	2 29	2 37	2 46	2 56	3 9	3 15	3 22	3 29	3 37	3 47
	24	2 50	3 4	3 19	3 36	3 46	3 57	4 11	4 28	4 35	4 44	4 54	5 5	5 18
	25	3 50	4 6	4 23	4 43	4 54	5 8	5 23	5 42	5 52	6 2	6 13	6 26	6 42
	26	4 52	5 9	5 27	5 48	6 0	6 13	6 30	6 50	6 59	7 10	7 22	7 36	7 52
	27	5 54	6 10	6 27	6 47	6 58	7 11	7 27	7 46	7 54	8 4	8 16	8 28	8 43
	28	6 54	7 8	7 23	7 40	7 50	8 1	8 14	8 30	8 38	8 46	8 55	9 6	9 18
	29	7 50	8 1	8 13	8 26	8 34	8 43	8 54	9 6	9 12	9 18	9 25	9 33	9 42
	30	8 41	8 49	8 58	9 7	9 13	9 19	9 26	9 35	9 39	9 43	9 48	9 53	9 59
ly	1	9 30	9 34	9 39	9 44	9 48	9 51	9 55	10 0	10 2	10 4	10 7	10 10	10 13
	2	10 16	10 17	10 18	10 19	10 19	10 20	10 21	10 22	10 22	10 23	10 23	10 24	10 24

TABLE X.

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 704.

For other longitudes and for southern latitudes see page 738.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July 1	21 54	21 51	21 48	21 45	21 43	21 41	21 38	21 36	21 34	21 33	21 31	21 29	21 27
2	22 39	22 40	22 40	22 41	22 42	22 42	22 43	22 44	22 45	22 45	22 46	22 46	22 47
3	23 22	23 26	23 30	23 36	23 39	23 42	23 46	23 51	23 53	23 56	23 58	....	....
4	....	....	....	....	....	....	....	....	....	....	....	0 1	0 4
5	0 5	0 13	0 21	0 30	0 35	0 41	0 48	0 56	1 0	1 4	1 9	1 15	1 21
6	0 49	1 0	1 11	1 23	1 30	1 39	1 49	2 0	2 6	2 12	2 19	2 27	2 36
7	1 34	1 47	2 1	2 16	2 26	2 36	2 48	3 4	3 11	3 18	3 28	3 38	3 49
8	2 20	2 35	2 51	3 9	3 20	3 32	3 47	4 4	4 13	4 22	4 33	4 45	4 59
9	3 8	3 24	3 42	4 2	4 13	4 27	4 42	5 2	5 11	5 22	5 33	5 47	6 3
10	3 58	4 14	4 32	4 52	5 4	5 18	5 34	5 55	6 4	6 15	6 27	6 41	6 58
11	4 48	5 4	5 21	5 41	5 53	6 6	6 22	6 41	6 50	7 0	7 12	7 25	7 41
12	5 38	5 53	6 9	6 27	6 38	6 50	7 4	7 21	7 29	7 38	7 48	8 0	8 13
13	6 28	6 41	6 54	7 10	7 19	7 29	7 41	7 55	8 2	8 9	8 18	8 27	8 37
14	7 18	7 27	7 38	7 50	7 57	8 4	8 14	8 25	8 30	8 35	8 41	8 48	8 56
15	8 6	8 12	8 19	8 28	8 32	8 37	8 43	8 50	8 54	8 57	9 1	9 6	9 11
16	8 54	8 57	9 0	9 4	9 6	9 8	9 11	9 14	9 16	9 18	9 19	9 21	9 24
17	9 42	9 41	9 40	9 40	9 39	9 39	9 38	9 37	9 37	9 37	9 36	9 36	9 35
18	10 31	10 26	10 22	10 16	10 14	10 10	10 6	10 1	9 59	9 57	9 54	9 52	9 48
19	11 22	11 14	11 5	10 56	10 50	10 44	10 36	10 28	10 24	10 19	10 14	10 9	10 3
20	12 15	12 4	11 52	11 38	11 30	11 21	11 10	10 58	10 52	10 46	10 38	10 30	10 21
21	13 12	12 57	12 42	12 25	12 15	12 4	11 50	11 34	11 27	11 18	11 9	10 58	10 46
22	14 10	13 54	13 37	13 18	13 6	12 53	12 38	12 19	12 10	12 0	11 49	11 36	11 22
23	15 10	14 54	14 36	14 16	14 4	13 50	13 34	13 14	13 5	12 54	12 42	12 28	12 12
24	16 11	15 55	15 38	15 18	15 7	14 54	14 38	14 19	14 10	14 0	13 49	13 36	13 20
25	17 9	16 55	16 40	16 23	16 13	16 1	15 48	15 31	15 24	15 15	15 5	14 54	14 41
26	18 4	17 53	17 41	17 27	17 19	17 10	16 59	16 46	16 40	16 33	16 26	16 17	16 8
27	18 56	18 48	18 40	18 30	18 24	18 18	18 10	18 1	17 57	17 53	17 47	17 42	17 35
28	19 45	19 40	19 36	19 30	19 27	19 24	19 19	19 15	19 12	19 10	19 7	19 4	19 0
29	20 31	20 30	20 29	20 28	20 28	20 27	20 26	20 25	20 25	20 24	20 24	20 23	20 23
30	21 16	21 19	21 21	21 24	21 26	21 28	21 31	21 34	21 35	21 37	21 38	21 40	21 42
31	22 0	22 6	22 12	22 20	22 24	22 28	22 34	22 41	22 44	22 48	22 51	22 56	23 0
Aug. 1	22 44	22 53	23 2	23 14	23 20	23 27	23 36	23 46	23 51	23 56	....	....	....
2	23 29	23 40	23 53	....	....	....	....	....	....	....	0 2	0 9	0 16
3	....	....	....	0 7	0 16	0 25	0 36	0 50	0 56	1 4	1 12	1 20	1 31
4	0 14	0 28	0 43	1 0	1 10	1 22	1 35	1 52	2 0	2 8	2 18	2 29	2 42
5	1 2	1 17	1 34	1 53	2 4	2 17	2 32	2 51	3 0	3 10	3 21	3 34	3 49
6	1 50	2 7	2 24	2 44	2 56	3 10	3 26	3 46	3 55	4 6	4 18	4 32	4 48
7	2 40	2 56	3 14	3 34	3 45	3 59	4 15	4 35	4 44	4 54	5 6	5 20	5 36
8	3 30	3 46	4 2	4 21	4 32	4 45	4 59	5 17	5 26	5 36	5 46	5 58	6 13
9	4 21	4 34	4 48	5 5	5 15	5 26	5 39	5 54	6 1	6 9	6 18	6 29	6 40
10	5 11	5 22	5 34	5 47	5 54	6 4	6 14	6 26	6 32	6 38	6 45	6 53	7 2
11	6 0	6 8	6 16	6 26	6 31	6 38	6 45	6 54	6 58	7 2	7 7	7 12	7 18
12	6 49	6 54	6 58	7 4	7 7	7 10	7 14	7 19	7 21	7 24	7 26	7 29	7 32
13	7 38	7 39	7 40	7 40	7 41	7 42	7 42	7 43	7 44	7 44	7 44	7 45	7 45
14	8 28	8 25	8 22	8 18	8 16	8 13	8 11	8 7	8 6	8 4	8 2	8 0	7 58
15	9 19	9 12	9 5	8 57	8 52	8 47	8 40	8 33	8 30	8 26	8 22	8 18	8 13
16	10 12	10 2	9 51	9 38	9 31	9 23	9 14	9 2	8 57	8 51	8 45	8 38	8 30
17	11 7	10 54	10 40	10 24	10 14	10 4	9 52	9 36	9 30	9 22	9 13	9 4	8 53

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET, MERIDIAN OF GREENWICH, 1919.

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Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July 1	9 30	9 34	9 39	9 44	9 48	9 51	9 55	10 0	10 2	10 4	10 7	10 10	10 13
2	10 16	10 17	10 18	10 19	10 19	10 20	10 21	10 22	10 22	10 23	10 23	10 24	10 24
3	11 0	10 57	10 55	10 52	10 50	10 48	10 46	10 43	10 42	10 40	10 39	10 37	10 35
4	11 43	11 37	11 31	11 24	11 20	11 16	11 10	11 4	11 2	10 58	10 55	10 51	10 47
5	12 27	12 18	12 9	11 58	11 52	11 45	11 36	11 27	11 22	11 17	11 13	11 6	10 58
6	13 11	12 59	12 47	12 33	12 25	12 16	12 5	11 52	11 46	11 39	11 32	11 24	11 14
7	13 56	13 43	13 28	13 11	13 1	12 50	12 37	12 21	12 14	12 5	11 56	11 46	11 33
8	14 44	14 28	14 12	13 53	13 42	13 29	13 14	12 56	12 47	12 37	12 26	12 14	12 0
9	15 32	15 16	14 58	14 38	14 26	14 13	13 57	13 37	13 28	13 17	13 5	12 51	12 35
10	16 22	16 6	15 48	15 28	15 16	15 2	14 46	14 26	14 16	14 6	13 54	13 40	13 23
11	17 12	16 57	16 40	16 21	16 10	15 57	15 41	15 22	15 14	15 4	14 52	14 39	14 24
12	18 3	17 49	17 34	17 17	17 7	16 56	16 42	16 25	16 18	16 9	15 59	15 48	15 35
13	18 52	18 41	18 29	18 15	18 6	17 57	17 46	17 33	17 27	17 20	17 12	17 3	16 54
14	19 41	19 33	19 24	19 13	19 8	19 1	18 53	18 43	18 39	18 34	18 29	18 23	18 16
15	20 29	20 24	20 19	20 13	20 9	20 5	20 1	19 55	19 53	19 50	19 47	19 43	19 39
16	21 17	21 16	21 14	21 13	21 12	21 11	21 10	21 8	21 8	21 7	21 6	21 5	21 4
17	22 5	22 8	22 11	22 14	22 15	22 17	22 20	22 23	22 24	22 25	22 27	22 29	22 31
18	22 55	23 1	23 8	23 16	23 20	23 25	23 31	23 38	23 41	23 45	23 49	23 53	23 58
19	23 47	23 57	....	....	....	....	....	....	....	....	....	....	....
20	....	....	0 7	0 19	0 26	0 34	0 43	0 55	1 0	1 6	1 12	1 20	1 28
21	0 42	0 55	1 8	1 24	1 33	1 44	1 56	2 11	2 19	2 26	2 35	2 46	2 57
22	1 39	1 54	2 11	2 29	2 40	2 53	3 8	3 26	3 34	3 44	3 55	4 8	4 22
23	2 39	2 55	3 13	3 33	3 45	3 58	4 15	4 34	4 44	4 54	5 6	5 20	5 36
24	3 39	3 56	4 13	4 33	4 45	4 58	5 14	5 34	5 43	5 53	6 5	6 18	6 34
25	4 39	4 54	5 10	5 28	5 39	5 51	6 5	6 23	6 31	6 40	6 50	7 2	7 15
26	5 36	5 48	6 2	6 17	6 26	6 36	6 48	7 2	7 9	7 16	7 24	7 34	7 44
27	6 29	6 39	6 49	7 1	7 8	7 15	7 24	7 34	7 39	7 44	7 50	7 57	8 4
28	7 20	7 26	7 32	7 40	7 44	7 49	7 55	8 1	8 4	8 8	8 11	8 15	8 20
29	8 7	8 10	8 13	8 16	8 18	8 20	8 22	8 25	8 26	8 27	8 29	8 31	8 33
30	8 53	8 52	8 51	8 50	8 49	8 49	8 48	8 47	8 46	8 46	8 45	8 45	8 44
31	9 37	9 33	9 29	9 23	9 20	9 17	9 13	9 9	9 6	9 4	9 2	8 59	8 56
Aug. 1	10 21	10 14	10 6	9 57	9 52	9 46	9 39	9 31	9 27	9 23	9 18	9 14	9 8
2	11 6	10 55	10 44	10 32	10 24	10 16	10 7	9 55	9 50	9 44	9 37	9 30	9 22
3	11 51	11 38	11 24	11 9	11 0	10 49	10 37	10 23	10 16	10 8	10 0	9 50	9 40
4	12 37	12 22	12 7	11 49	11 38	11 26	11 12	10 54	10 47	10 37	10 27	10 16	10 2
5	13 25	13 9	12 52	12 32	12 21	12 8	11 52	11 33	11 24	11 14	11 2	10 49	10 34
6	14 14	13 58	13 40	13 20	13 8	12 54	12 38	12 18	12 9	11 58	11 46	11 32	11 16
7	15 4	14 48	14 31	14 11	14 0	13 47	13 31	13 12	13 2	12 52	12 40	12 27	12 11
8	15 55	15 40	15 24	15 6	14 56	14 44	14 30	14 12	14 4	13 54	13 44	13 32	13 18
9	16 45	16 32	16 19	16 4	15 55	15 45	15 33	15 18	15 11	15 4	14 55	14 46	14 34
10	17 35	17 25	17 15	17 3	16 56	16 48	16 39	16 28	16 23	16 17	16 11	16 3	15 55
11	18 24	18 18	18 11	18 3	17 59	17 54	17 48	17 41	17 37	17 34	17 30	17 25	17 20
12	19 13	19 10	19 7	19 4	19 2	19 0	18 58	18 55	18 53	18 52	18 50	18 48	18 46
13	20 2	20 3	20 5	20 6	20 7	20 8	20 9	20 10	20 11	20 11	20 12	20 13	20 14
14	20 52	20 57	21 3	21 9	21 12	21 16	21 21	21 26	21 29	21 32	21 35	21 39	21 43
15	21 44	21 53	22 2	22 12	22 19	22 26	22 34	22 44	22 48	22 53	22 59	23 5	23 12
16	22 38	22 50	23 3	23 17	23 26	23 35	23 47	....	....	....	....	....	....
17	23 34	23 49	....	....	....	....	....	0 0	0 7	0 14	0 22	0 31	0 42

TABLE X.

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 704.

For other longitudes and for southern latitudes see page 738.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Aug. 16	10 12	10 2	9 51	9 38	9 31	9 23	9 14	9 2	8 57	8 51	8 45	8 38	8 30
17	11 7	10 54	10 40	10 24	10 14	10 4	9 52	9 36	9 30	9 22	9 13	9 4	8 53
18	12 4	11 49	11 33	11 14	11 3	10 51	10 36	10 18	10 10	10 1	9 50	9 38	9 24
19	13 3	12 47	12 29	12 9	11 57	11 44	11 28	11 8	10 59	10 49	10 37	10 24	10 8
20	14 2	13 46	13 28	13 8	12 57	12 44	12 28	12 8	11 59	11 49	11 37	11 24	11 8
21	14 59	14 44	14 29	14 10	14 0	13 48	13 34	13 16	13 8	12 59	12 48	12 36	12 23
22	15 54	15 42	15 29	15 13	15 5	14 55	14 43	14 28	14 22	14 14	14 6	13 56	13 45
23	16 47	16 37	16 27	16 16	16 9	16 2	15 53	15 42	15 37	15 32	15 25	15 19	15 11
24	17 36	17 30	17 24	17 16	17 12	17 7	17 2	16 55	16 52	16 48	16 44	16 40	16 35
25	18 23	18 21	18 18	18 15	18 14	18 11	18 9	18 6	18 5	18 4	18 2	18 0	17 59
26	19 9	19 10	19 11	19 12	19 13	19 14	19 15	19 16	19 17	19 17	19 18	19 19	19 20
27	19 54	19 58	20 3	20 8	20 11	20 15	20 19	20 24	20 26	20 29	20 32	20 35	20 38
28	20 38	20 46	20 54	21 3	21 8	21 14	21 22	21 30	21 34	21 39	21 44	21 49	21 56
29	21 22	21 33	21 44	21 57	22 5	22 13	22 23	22 35	22 41	22 47	22 54	23 2	23 11
30	22 8	22 21	22 35	22 51	23 0	23 10	23 23	23 38	23 45	23 53	....	....	....
31	22 55	23 10	23 25	23 43	23 54	....	....	....	....	....	0 2	0 12	0 24
Sept. 1	23 42	23 58	....	....	....	0 6	0 20	0 38	0 47	0 56	1 6	1 18	1 32
2	....	....	0 15	0 35	0 46	1 0	1 14	1 34	1 44	1 54	2 5	2 19	2 34
3	0 31	0 47	1 5	1 25	1 36	1 50	2 6	2 26	2 35	2 45	2 57	3 10	3 26
4	1 21	1 36	1 53	2 12	2 24	2 37	2 52	3 11	3 19	3 29	3 40	3 53	4 8
5	2 11	2 25	2 40	2 58	3 8	3 19	3 33	3 49	3 57	4 6	4 16	4 26	4 39
6	3 0	3 12	3 25	3 40	3 49	3 58	4 10	4 24	4 30	4 37	4 45	4 54	5 4
7	3 50	3 59	4 9	4 20	4 27	4 34	4 43	4 53	4 58	5 3	5 9	5 15	5 23
8	4 40	4 46	4 52	4 59	5 3	5 8	5 14	5 20	5 23	5 26	5 30	5 34	5 38
9	5 29	5 32	5 34	5 37	5 39	5 41	5 43	5 45	5 46	5 48	5 49	5 50	5 52
10	6 20	6 18	6 17	6 15	6 14	6 13	6 12	6 10	6 9	6 9	6 8	6 7	6 6
11	7 12	7 7	7 1	6 54	6 51	6 47	6 42	6 36	6 34	6 31	6 28	6 24	6 20
12	8 6	7 57	7 47	7 36	7 30	7 23	7 15	7 5	7 1	6 56	6 50	6 44	6 37
13	9 2	8 50	8 36	8 22	8 13	8 3	7 52	7 38	7 32	7 25	7 18	7 9	6 59
14	9 59	9 45	9 29	9 12	9 1	8 49	8 36	8 19	8 11	8 2	7 52	7 41	7 28
15	10 58	10 42	10 25	10 6	9 54	9 41	9 26	9 7	8 58	8 48	8 37	8 24	8 9
16	11 57	11 41	11 24	11 4	10 52	10 39	10 23	10 4	9 55	9 45	9 33	9 20	9 4
17	12 54	12 39	12 23	12 4	11 54	11 41	11 27	11 9	11 0	10 51	10 40	10 28	10 14
18	13 49	13 36	13 22	13 6	12 57	12 46	12 34	12 18	12 11	12 3	11 54	11 44	11 32
19	14 41	14 31	14 20	14 7	14 0	13 52	13 42	13 30	13 25	13 18	13 12	13 4	12 55
20	15 31	15 24	15 16	15 7	15 2	14 57	14 50	14 42	14 38	14 34	14 29	14 24	14 19
21	16 18	16 14	16 10	16 6	16 3	16 0	15 56	15 52	15 50	15 48	15 46	15 43	15 40
22	17 4	17 3	17 3	17 2	17 2	17 2	17 2	17 1	17 1	17 1	17 1	17 1	17 1
23	17 48	17 51	17 55	17 58	18 0	18 3	18 6	18 9	18 11	18 12	18 14	18 17	18 19
24	18 33	18 39	18 46	18 53	18 58	19 3	19 9	19 16	19 19	19 23	19 27	19 32	19 37
25	19 17	19 26	19 36	19 48	19 54	20 2	20 11	20 21	20 26	20 32	20 38	20 45	20 52
26	20 2	20 14	20 27	20 42	20 50	21 0	21 11	21 25	21 32	21 39	21 47	21 56	22 6
27	20 49	21 3	21 18	21 35	21 45	21 56	22 10	22 26	22 34	22 43	22 53	23 4	23 16
28	21 36	21 51	22 8	22 27	22 38	22 50	23 5	23 24	23 23	23 42	23 53	....	....
29	22 24	22 40	22 57	23 17	23 28	23 42	23 57	....	....	....	....	0 6	0 21
30	23 12	23 28	23 45	....	....	....	....	0 16	0 26	0 36	0 47	1 1	1 16
Oct. *1*	....	....	....	0 5	0 16	0 29	0 44	1 3	1 12	1 22	1 34	1 47	2 2
2	0 1	0 16	0 32	0 50	1 1	1 13	1 27	1 44	1 52	2 0	2 12	2 23	2 37

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET, MERIDIAN OF GREENWICH, 1919.

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Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Aug. 16	22 38	22 50	23 3	23 17	23 26	23 35	23 47	....	....	....	....	....	....
17	23 34	23 49	....	....	....	....	....	0 0	0 7	0 14	0 22	0 31	0 42
18	....	....	0 4	0 22	0 32	0 44	0 58	1 15	1 23	1 32	1 42	1 54	2 7
19	0 32	0 48	1 5	1 25	1 37	1 50	2 5	2 25	2 34	2 44	2 56	3 9	3 24
20	1 31	1 48	2 5	2 25	2 37	2 50	3 6	3 26	3 35	3 46	3 58	4 11	4 27
21	2 29	2 45	3 1	3 20	3 32	3 44	3 59	4 17	4 26	4 35	4 46	4 59	5 13
22	3 26	3 40	3 54	4 10	4 20	4 31	4 44	4 59	5 7	5 14	5 23	5 34	5 45
23	4 20	4 31	4 42	4 55	5 3	5 12	5 22	5 34	5 39	5 45	5 52	6 0	6 8
24	5 11	5 18	5 26	5 36	5 41	5 47	5 54	6 2	6 6	6 10	6 15	6 20	6 26
25	5 59	6 3	6 8	6 13	6 16	6 19	6 23	6 27	6 29	6 32	6 34	6 37	6 40
26	6 46	6 46	6 47	6 48	6 48	6 49	6 49	6 50	6 50	6 51	6 51	6 52	6 52
27	7 30	7 28	7 25	7 22	7 20	7 18	7 15	7 12	7 11	7 9	7 8	7 6	7 4
28	8 15	8 9	8 3	7 55	7 51	7 46	7 41	7 34	7 31	7 28	7 24	7 20	7 16
29	9 0	8 51	8 41	8 30	8 24	8 17	8 8	7 58	7 54	7 49	7 43	7 37	7 30
30	9 45	9 33	9 21	9 6	8 58	8 49	8 38	8 25	8 19	8 12	8 4	7 56	7 47
31	10 31	10 17	10 2	9 45	9 35	9 24	9 11	8 55	8 48	8 39	8 30	8 20	8 8
Sept. 1	11 18	11 2	10 46	10 27	10 16	10 4	9 49	9 31	9 22	9 12	9 2	8 49	8 35
2	12 6	11 50	11 33	11 13	11 1	10 48	10 32	10 13	10 4	9 53	9 42	9 28	9 12
3	12 55	12 39	12 22	12 2	11 50	11 37	11 21	11 2	10 52	10 42	10 30	10 17	10 1
4	13 45	13 30	13 13	12 55	12 44	12 31	12 16	11 58	11 50	11 40	11 29	11 17	11 2
5	14 35	14 21	14 7	13 50	13 41	13 30	13 17	13 1	12 54	12 45	12 36	12 25	12 13
6	15 24	15 13	15 2	14 48	14 41	14 32	14 21	14 9	14 3	13 56	13 49	13 41	13 32
7	16 14	16 6	15 58	15 48	15 43	15 36	15 29	15 20	15 16	15 12	15 6	15 1	14 54
8	17 3	16 59	16 55	16 49	16 46	16 43	16 39	16 34	16 32	16 29	16 27	16 24	16 20
9	17 53	17 53	17 52	17 52	17 52	17 51	17 51	17 50	17 50	17 50	17 49	17 49	17 49
10	18 44	18 48	18 52	18 56	18 58	19 1	19 4	19 8	19 10	19 12	19 14	19 16	19 19
11	19 37	19 44	19 52	20 1	20 6	20 12	20 19	20 27	20 31	20 35	20 40	20 45	20 51
12	20 32	20 43	20 54	21 7	21 15	21 24	21 34	21 46	21 52	21 58	22 . 5	22 13	22 22
13	21 29	21 42	21 57	22 14	22 23	22 34	22 47	23 3	23 11	23 19	23 28	23 39	23 52
14	22 27	22 43	22 59	23 18	23 30	23 42	23 57	....	....	....	....	....	....
15	23 26	23 43	....	....	....	....	....	0 16	0 24	0 34	0 45	0 58	1 13
16	....	....	0 0	0 20	0 31	0 45	1 1	1 20	1 29	1 39	1 51	2 4	2 20
17	0 24	0 40	0 57	1 16	1 28	1 40	1 56	2 14	2 23	2 32	2 44	2 56	3 11
18	1 21	1 35	1 50	2 7	2 17	2 29	2 42	2 58	3 6	3 14	3 24	3 34	3 47
19	2 15	2 26	2 39	2 53	3 1	3 11	3 22	3 35	3 41	3 47	3 55	4 3	4 13
20	3 5	3 14	3 24	3 34	3 40	3 47	3 55	4 4	4 9	4 14	4 19	4 25	4 32
21	3 54	3 59	4 5	4 12	4 16	4 20	4 24	4 30	4 33	4 36	4 39	4 43	4 47
22	4 40	4 42	4 44	4 47	4 48	4 50	4 52	4 54	4 55	4 56	4 57	4 59	5 0
23	5 25	5 24	5 22	5 21	5 20	5 19	5 18	5 16	5 15	5 14	5 14	5 13	5 12
24	6 10	6 5	6 0	5 55	5 51	5 48	5 43	5 38	5 36	5 33	5 30	5 27	5 24
25	6 54	6 46	6 38	6 29	6 23	6 17	6 10	6 2	5 58	5 53	5 49	5 43	5 37
26	7 39	7 29	7 17	7 5	6 57	6 49	6 39	6 27	6 22	6 16	6 9	6 2	5 53
27	8 25	8 12	7 58	7 43	7 34	7 23	7 11	6 56	6 49	6 42	6 33	6 24	6 13
28	9 12	8 57	8 41	8 24	8 13	8 1	7 47	7 30	7 22	7 12	7 2	6 51	6 38
29	9 59	9 44	9 27	9 7	8 56	8 43	8 28	8 9	8 0	7 50	7 39	7 26	7 11
30	10 48	10 32	10 14	9 55	9 43	9 30	9 14	8 55	8 46	8 36	8 24	8 11	7 55
Oct. 1	11 36	11 21	11 4	10 45	10 34	10 21	10 6	9 48	9 39	9 29	9 18	9 5	8 50
2	12 25	12 11	11 56	11 39	11 28	11 17	11 3	10 46	10 39	10 30	10 20	10 9	9 58

TABLE X.

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

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Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct. 1	....	....	....	0 5	0 16	0 29	0 44	1 3	1 12	1 22	1 34	1 47	2 2
2	0 1	0 16	0 32	0 50	1 1	1 13	1 27	1 44	1 52	2 0	2 12	2 23	2 37
3	0 50	1 3	1 17	1 33	1 42	1 52	2 5	2 20	2 26	2 34	2 43	2 52	3 4
4	1 39	1 49	2 1	2 13	2 21	2 29	2 39	2 51	2 56	3 2	3 9	3 16	3 25
5	2 28	2 35	2 43	2 52	2 57	3 3	3 10	3 18	3 22	3 26	3 30	3 36	3 41
6	3 17	3 21	3 25	3 30	3 33	3 36	3 40	3 44	3 46	3 49	3 51	3 54	3 56
7	4 7	4 7	4 8	4 8	4 8	4 9	4 9	4 10	4 10	4 10	4 10	4 10	4 11
8	4 58	4 55	4 51	4 47	4 45	4 42	4 39	4 35	4 34	4 32	4 30	4 28	4 25
9	5 52	5 45	5 38	5 29	5 24	5 18	5 11	5 4	5 0	4 56	4 52	4 47	4 41
10	6 49	6 38	6 27	6 14	6 6	5 58	5 48	5 36	5 31	5 25	5 18	5 11	5 2
11	7 48	7 34	7 20	7 4	6 54	6 43	6 30	6 15	6 7	6 0	5 50	5 40	5 29
12	8 49	8 33	8 17	7 58	7 47	7 34	7 20	7 1	6 53	6 44	6 33	6 21	6 7
13	9 50	9 34	9 16	8 57	8 45	8 32	8 16	7 57	7 48	7 38	7 27	7 14	6 58
14	10 49	10 33	10 17	9 58	9 47	9 34	9 20	9 1	8 53	8 43	8 32	8 20	8 5
15	11 45	11 32	11 17	11 0	10 51	10 40	10 27	10 11	10 3	9 55	9 46	9 35	9 22
16	12 39	12 28	12 16	12 2	11 54	11 45	11 35	11 22	11 16	11 10	11 2	10 54	10 44
17	13 29	13 20	13 12	13 2	12 56	12 50	12 42	12 33	12 29	12 25	12 19	12 14	12 7
18	14 16	14 11	14 6	14 0	13 57	13 53	13 48	13 43	13 41	13 38	13 35	13 32	13 28
19	15 1	15 0	14 58	14 57	14 56	14 54	14 53	14 52	14 51	14 50	14 50	14 49	14 48
20	15 46	15 48	15 50	15 52	15 53	15 55	15 56	15 59	16 0	16 1	16 2	16 4	16 5
21	16 29	16 35	16 40	16 46	16 50	16 54	17 0	17 5	17 8	17 11	17 14	17 18	17 22
22	17 14	17 22	17 31	17 41	17 46	17 53	18 1	18 10	18 15	18 19	18 25	18 31	18 38
23	17 58	18 9	18 21	18 34	18 42	18 51	19 2	19 14	19 20	19 27	19 34	19 42	19 52
24	18 44	18 58	19 12	19 28	19 37	19 48	20 1	20 16	20 24	20 32	20 41	20 51	21 3
25	19 31	19 46	20 2	20 20	20 31	20 43	20 58	21 15	21 24	21 33	21 44	21 56	22 10
26	20 19	20 35	20 52	21 11	21 22	21 35	21 51	22 10	22 19	22 29	22 40	22 53	23 9
27	21 7	21 23	21 40	21 59	22 11	22 24	22 39	22 58	23 7	23 17	23 29	23 42	23 57
28	21 55	22 10	22 27	22 45	22 56	23 8	23 23	23 41	23 49	23 58	....	....	....
29	22 43	22 57	23 11	23 28	23 38	23 49	....	....	....	....	0 9	0 21	0 35
30	23 31	23 42	23 54	....	....	....	0 2	0 18	0 25	0 33	0 42	0 53	1 5
31	....	....	....	0 8	0 17	0 26	0 36	0 49	0 56	1 2	1 10	1 18	1 27
Nov. 1	0 18	0 27	0 36	0 47	0 53	1 0	1 8	1 18	1 22	1 27	1 32	1 38	1 45
2	1 5	1 11	1 17	1 24	1 28	1 32	1 37	1 44	1 46	1 49	1 53	1 56	2 1
3	1 54	1 56	1 58	2 0	2 2	2 4	2 6	2 8	2 9	2 10	2 12	2 13	2 14
4	2 43	2 42	2 40	2 38	2 37	2 36	2 35	2 33	2 32	2 31	2 31	2 30	2 28
5	3 35	3 30	3 24	3 18	3 14	3 10	3 5	3 0	2 57	2 54	2 51	2 48	2 44
6	4 30	4 21	4 12	4 1	3 54	3 47	3 39	3 30	3 25	3 20	3 15	3 9	3 2
7	5 29	5 16	5 4	4 49	4 40	4 30	4 19	4 5	3 59	3 52	3 44	3 35	3 26
8	6 30	6 16	6 0	5 42	5 32	5 20	5 6	4 49	4 41	4 32	4 23	4 11	3 58
9	7 33	7 17	7 0	6 41	6 30	6 17	6 1	5 43	5 34	5 24	5 13	5 0	4 45
10	8 36	8 20	8 3	7 44	7 32	7 20	7 4	6 46	6 37	6 27	6 16	6 3	5 48
11	9 36	9 22	9 6	8 49	8 38	8 27	8 13	7 56	7 48	7 39	7 29	7 18	7 4
12	10 32	10 20	10 7	9 53	9 44	9 35	9 23	9 9	9 3	8 56	8 47	8 38	8 28
13	11 25	11 16	11 6	10 55	10 49	10 41	10 33	10 23	10 18	10 12	10 7	10 0	9 52
14	12 14	12 8	12 2	11 55	11 51	11 46	11 41	11 34	11 32	11 28	11 25	11 20	11 16
15	13 0	12 58	12 56	12 52	12 51	12 48	12 46	12 44	12 43	12 41	12 40	12 38	12 36
16	13 44	13 46	13 47	13 48	13 48	13 49	13 50	13 51	13 52	13 52	13 53	13 54	13 54

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET, MERIDIAN OF GREENWICH, 1919.

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Lat. / Date.		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h .m	h m	h m	h m	h m
Oct.	1	11 36	11 21	11 4	10 45	10 34	10 21	10 6	9 48	9 39	9 29	9 18	9 5	8 50
	2	12 25	12 11	11 56	11 39	11 28	11 17	11 3	10 46	10 39	10 30	10 20	10 9	9 56
	3	13 14	13 2	12 49	12 34	12 26	12 16	12 4	11 50	11 44	11 37	11 29	11 20	11 9
	4	14 2	13 53	13 43	13 32	13 25	13 18	13 9	12 59	12 54	12 48	12 42	12 35	12 28
	5	14 51	14 45	14 39	14 31	14 27	14 22	14 17	14 10	14 7	14 4	14 0	13 55	13 51
	6	15 40	15 38	15 36	15 33	15 31	15 29	15 27	15 25	15 23	15 22	15 21	15 19	15 17
	7	16 31	16 33	16 34	16 36	16 37	16 38	16 40	16 41	16 42	16 43	16 44	16 45	16 46
	8	17 24	17 29	17 35	17 42	17 46	17 50	17 55	18 1	18 4	18 7	18 10	18 14	18 18
	9	18 19	18 28	18 38	18 49	18 56	19 3	19 11	19 22	19 26	19 32	19 38	19 44	19 52
	10	19 17	19 29	19 42	19 58	20 6	20 16	20 28	20 42	20 49	20 57	21 5	21 15	21 26
	11	20 17	20 32	20 47	21 5	21 16	21 28	21 42	22 0	22 8	22 17	22 28	22 39	22 53
	12	21 18	21 34	21 51	22 10	22 22	22 35	22 50	23 9	23 18	23 28	23 40	23 53	. . . .
	13	22 18	22 34	22 51	23 10	23 22	23 34	23 50	. . . .	. . . .	. . . .	. . . .	. . . .	0 8
	14	23 16	23 31	23 46	. . . .	. . . .	. . . .	. . . .	0 9	0 18	0 27	0 38	0 51	1 6
	15	. . . .	. . . .	. . . .	0 4	0 14	0 26	0 40	0 57	1 6	1 14	1 24	1 35	1 48
	16	0 11	0 24	0 37	0 52	1 0	1 10	1 22	1 36	1 42	1 50	1 58	2 6	2 17
	17	1 3	1 12	1 23	1 34	1 41	1 48	1 57	2 8	2 12	2 18	2 24	2 30	2 38
	18	1 52	1 58	2 5	2 13	2 17	2 22	2 28	2 35	2 38	2 41	2 45	2 49	2 54
	19	2 38	2 41	2 44	2 48	2 50	2 53	2 55	2 59	3 0	3 2	3 3	3 5	3 8
	20	3 23	3 22	3 22	3 22	3 22	3 22	3 21	3 21	3 21	3 20	3 20	3 20	3 20
	21	4 7	4 3	4 0	3 55	3 53	3 50	3 47	3 43	3 41	3 39	3 37	3 34	3 32
	22	4 51	4 44	4 37	4 29	4 24	4 19	4 13	4 6	4 2	3 59	3 55	3 50	3 45
	23	5 35	5 26	5 16	5 4	4 57	4 50	4 41	4 30	4 25	4 20	4 14	4 7	4 0
	24	6 21	6 9	5 56	5 41	5 33	5 23	5 12	4 58	4 52	4 45	4 37	4 28	4 18
	25	7 7	6 53	6 38	6 21	6 11	6 0	5 46	5 30	5 22	5 14	5 4	4 54	4 41
	26	7 54	7 39	7 23	7 4	6 53	6 40	6 26	6 7	5 59	5 49	5 38	5 26	5 12
	27	8 42	8 26	8 10	7 50	7 38	7 25	7 10	6 51	6 42	6 32	6 20	6 7	5 52
	28	9 31	9 15	8 58	8 39	8 28	8 14	8 0	7 41	7 32	7 22	7 10	6 58	6 42
	29	10 19	10 4	9 49	9 31	9 20	9 8	8 54	8 37	8 29	8 19	8 9	7 57	7 43
	30	11 6	10 54	10 40	10 24	10 15	10 5	9 52	9 38	9 30	9 23	9 14	9 4	8 52
	31	11 54	11 43	11 32	11 20	11 12	11 4	10 54	10 42	10 37	10 31	10 24	10 16	10 8
Nov.	1	12 41	12 34	12 26	12 17	12 12	12 6	11 59	11 50	11 46	11 42	11 37	11 32	11 26
	2	13 28	13 24	13 20	13 15	13 12	13 9	13 5	13 1	12 59	12 56	12 54	12 51	12 48
	3	14 17	14 16	14 16	14 16	14 16	14 15	14 15	14 14	14 14	14 14	14 14	14 14	14 13
	4	15 7	15 11	15 14	15 19	15 21	15 24	15 27	15 31	15 32	15 34	15 36	15 39	15 42
	5	16 1	16 8	16 16	16 24	16 30	16 35	16 42	16 50	16 54	16 58	17 3	17 8	17 14
	6	16 57	17 8	17 20	17 33	17 40	17 49	17 59	18 12	18 17	18 24	18 31	18 39	18 48
	7	17 58	18 11	18 26	18 42	18 52	19 3	19 16	19 32	19 40	19 48	19 58	20 9	20 21
	8	19 0	19 16	19 32	19 51	20 2	20 15	20 30	20 48	20 57	21 7	21 18	21 30	21 45
	9	20 3	20 19	20 36	20 56	21 7	21 20	21 36	21 55	22 4	22 14	22 25	22 38	22 54
	10	21 5	21 20	21 36	21 55	22 5	22 18	22 32	22 50	22 58	23 8	23 18	23 30	23 44
	11	22 3	22 16	22 31	22 47	22 56	23 7	23 19	23 34	23 41	23 49	23 58	. . . .	. . . .
	12	22 58	23 8	23 20	23 32	23 40	23 48	23 58	. . . .	. . . .	. . . .	. . . .	0 7	0 18
	13	23 49	23 56	. . . .	. . . .	. . . .	. . . .	. . . .	0 9	0 15	0 20	0 27	0 34	0 43
	14	. . . .	. . . .	0 4	0 13	0 18	0 24	0 30	0 38	0 42	0 46	0 50	0 55	1 1
	15	0 36	0 40	0 44	0 50	0 52	0 56	0 59	1 3	1 5	1 8	1 10	1 12	1 15
	16	1 22	1 22	1 23	1 24	1 24	1 25	1 26	1 26	1 27	1 27	1 27	1 28	1 28

TABLE X.

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE, MERIDIAN OF GREENWICH.

1919.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 704.

For other longitudes and for southern latitudes see page 738.

Lat. Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Nov. 16	13 44	13 46	13 47	13 48	13 48	13 49	13 50	13 51	13 52	13 52	13 53	13 54	13 54
17	14 28	14 32	14 37	14 42	14 45	14 48	14 52	14 57	15 0	15 2	15 4	15 8	15 11
18	15 12	15 19	15 27	15 36	15 41	15 47	15 54	16 2	16 6	16 10	16 15	16 21	16 27
19	15 56	16 6	16 17	16 30	16 37	16 45	16 54	17 6	17 11	17 17	17 24	17 32	17 40
20	16 41	16 54	17 7	17 23	17 32	17 42	17 54	18 9	18 16	18 23	18 32	18 41	18 53
21	17 28	17 42	17 58	18 15	18 26	18 38	18 52	19 9	19 17	19 26	19 36	19 47	20 1
22	18 15	18 31	18 48	19 7	19 18	19 31	19 46	20 5	20 13	20 23	20 35	20 48	21 2
23	19 4	19 20	19 36	19 56	20 8	20 21	20 36	20 55	21 4	21 14	21 26	21 39	21 54
24	19 52	20 7	20 24	20 43	20 54	21 7	21 21	21 40	21 49	21 58	22 9	22 22	22 36
25	20 40	20 54	21 9	21 26	21 37	21 48	22 2	22 18	22 26	22 35	22 44	22 55	23 8
26	21 27	21 39	21 52	22 7	22 16	22 26	22 38	22 52	22 58	23 5	23 13	23 22	23 32
27	22 14	22 23	22 34	22 46	22 52	23 0	23 9	23 20	23 25	23 31	23 37	23 44	23 51
28	23 0	23 6	23 14	23 22	23 27	23 32	23 39	23 46	23 50	23 53	23 57	....	....
29	23 46	23 50	23 53	23 58	....	....	....	....	....	....	....	0 2	0 7
30	....	....	....	....	0 0	0 3	0 6	0 10	0 12	0 14	0 16	0 18	0 21
Dec. 1	0 33	0 33	0 33	0 33	0 34	0 34	0 34	0 34	0 34	0 34	0 34	0 34	0 34
2	1 22	1 18	1 15	1 10	1 8	1 5	1 2	0 58	0 57	0 55	0 53	0 51	0 48
3	2 13	2 6	1 59	1 50	1 45	1 40	1 33	1 26	1 22	1 18	1 14	1 10	1 4
4	3 8	2 58	2 47	2 34	2 27	2 18	2 9	1 57	1 52	1 46	1 39	1 32	1 24
5	4 8	3 54	3 40	3 24	3 14	3 3	2 50	2 35	2 28	2 20	2 11	2 2	1 50
6	5 10	4 54	4 38	4 19	4 8	3 56	3 41	3 23	3 15	3 5	2 55	2 43	2 29
7	6 14	5 58	5 41	5 21	5 10	4 56	4 41	4 22	4 13	4 3	3 51	3 38	3 23
8	7 17	7 2	6 46	6 27	6 16	6 4	5 49	5 30	5 22	5 12	5 2	4 49	4 35
9	8 18	8 4	7 50	7 34	7 24	7 14	7 1	6 45	6 38	6 30	6 21	6 10	5 58
10	9 14	9 4	8 52	8 40	8 32	8 24	8 14	8 2	7 57	7 50	7 43	7 36	7 27
11	10 6	9 59	9 52	9 43	9 38	9 32	9 26	9 18	9 14	9 10	9 5	9 0	8 54
12	10 55	10 52	10 48	10 43	10 40	10 38	10 34	10 30	10 28	10 26	10 24	10 22	10 19
13	11 42	11 41	11 41	11 41	11 41	11 40	11 40	11 40	11 40	11 40	11 40	11 40	11 40
14	12 26	12 29	12 33	12 36	12 39	12 41	12 44	12 48	12 49	12 51	12 53	12 55	12 58
15	13 10	13 16	13 23	13 31	13 35	13 40	13 46	13 53	13 57	14 0	14 4	14 9	14 14
16	13 54	14 4	14 13	14 25	14 31	14 38	14 47	14 58	15 3	15 8	15 14	15 21	15 28
17	14 39	14 51	15 3	15 18	15 26	15 36	15 47	16 1	16 7	16 14	16 22	16 31	16 42
18	15 25	15 39	15 54	16 10	16 20	16 32	16 45	17 2	17 9	17 18	17 28	17 38	17 51
19	16 12	16 27	16 44	17 2	17 13	17 26	17 41	17 59	18 8	18 17	18 28	18 40	18 55
20	17 0	17 16	17 33	17 52	18 4	18 17	18 32	18 52	19 1	19 11	19 22	19 36	19 51
21	17 49	18 4	18 21	18 40	18 52	19 5	19 20	19 39	19 47	19 58	20 9	20 22	20 36
22	18 37	18 52	19 7	19 26	19 36	19 48	20 2	20 20	20 28	20 37	20 47	20 58	21 12
23	19 25	19 38	19 52	20 8	20 17	20 27	20 40	20 55	21 2	21 9	21 18	21 28	21 39
24	20 12	20 23	20 34	20 47	20 54	21 3	21 13	21 25	21 30	21 36	21 43	21 51	21 59
25	20 58	21 6	21 14	21 24	21 29	21 36	21 43	21 51	21 56	22 0	22 5	22 10	22 16
26	21 44	21 48	21 54	21 59	22 2	22 6	22 11	22 16	22 18	22 21	22 24	22 27	22 30
27	22 30	22 31	22 32	22 34	22 35	22 36	22 38	22 39	22 40	22 41	22 42	22 42	22 44
28	23 16	23 14	23 12	23 10	23 8	23 7	23 5	23 2	23 2	23 0	22 59	22 58	22 56
29	....	23 59	23 53	23 47	23 43	23 38	23 34	23 28	23 25	23 22	23 18	23 15	23 11
30	0 5	....	....	....	....	....	....	23 56	23 51	23 46	23 41	23 34	23 26
31	0 56	0 47	0 38	0 27	0 21	0 13	0 5	....	....	....	....	....	23 50
32	1 51	1 39	1 26	1 12	1 3	0 54	0 42	0 29	0 23	0 16	0 8	0 0	....

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET, MERIDIAN OF GREENWICH, 1919.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 704.

For other longitudes and for southern latitudes see page 738.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Nov. 16	1 22	1 22	1 23	1 24	1 24	1 25	1 26	1 26	1 27	1 27	1 27	1 28	1 28
17	2 6	2 4	2 0	1 57	1 56	1 54	1 51	1 48	1 47	1 46	1 44	1 42	1 40
18	2 49	2 44	2 38	2 30	2 27	2 22	2 17	2 11	2 8	2 5	2 1	1 57	1 53
19	3 33	3 25	3 16	3 5	2 59	2 52	2 44	2 34	2 30	2 25	2 20	2 14	2 7
20	4 18	4 7	3 55	3 41	3 33	3 24	3 14	3 1	2 55	2 48	2 41	2 33	2 24
21	5 4	4 51	4 36	4 20	4 10	3 59	3 46	3 31	3 23	3 16	3 7	2 57	2 45
22	5 51	5 36	5 20	5 2	4 51	4 39	4 24	4 7	3 58	3 49	3 39	3 27	3 13
23	6 39	6 23	6 6	5 47	5 35	5 22	5 7	4 48	4 39	4 29	4 18	4 5	3 50
24	7 27	7 11	6 54	6 35	6 24	6 11	5 55	5 36	5 27	5 17	5 6	4 53	4 37
25	8 15	8 0	7 44	7 26	7 15	7 3	6 48	6 30	6 22	6 12	6 2	5 49	5 35
26	9 3	8 50	8 35	8 19	8 9	7 58	7 45	7 29	7 22	7 14	7 4	6 54	6 41
27	9 50	9 38	9 26	9 13	9 5	8 56	8 45	8 32	8 26	8 19	8 12	8 3	7 54
28	10 36	10 27	10 18	10 8	10 2	9 55	9 47	9 38	9 33	9 28	9 23	9 16	9 10
29	11 22	11 17	11 11	11 4	11 1	10 56	10 51	10 45	10 42	10 39	10 36	10 32	10 28
30	12 8	12 6	12 4	12 2	12 1	11 59	11 57	11 55	11 54	11 53	11 52	11 50	11 49
Dec. 1	12 56	12 58	13 0	13 1	13 3	13 4	13 5	13 7	13 8	13 9	13 10	13 11	13 12
2	13 46	13 51	13 57	14 4	14 7	14 11	14 16	14 22	14 25	14 28	14 31	14 35	14 39
3	14 39	14 48	14 58	15 8	15 15	15 22	15 30	15 40	15 45	15 50	15 56	16 2	16 10
4	15 36	15 48	16 1	16 16	16 25	16 34	16 46	17 0	17 7	17 14	17 22	17 31	17 42
5	16 37	16 51	17 7	17 25	17 35	17 47	18 1	18 19	18 27	18 36	18 46	18 58	19 11
6	17 40	17 56	18 13	18 32	18 44	18 57	19 12	19 31	19 40	19 50	20 2	20 15	20 30
7	18 44	19 0	19 17	19 36	19 47	20 0	20 16	20 34	20 43	20 53	21 4	21 16	21 31
8	19 46	20 0	20 16	20 33	20 44	20 55	21 9	21 25	21 33	21 42	21 51	22 2	22 15
9	20 45	20 57	21 10	21 24	21 32	21 42	21 53	22 6	22 12	22 19	22 26	22 35	22 44
10	21 40	21 48	21 58	22 8	22 14	22 21	22 29	22 39	22 43	22 48	22 53	23 0	23 6
11	22 30	22 36	22 41	22 48	22 52	22 56	23 1	23 6	23 9	23 12	23 15	23 19	23 23
12	23 18	23 20	23 22	23 24	23 26	23 27	23 29	23 31	23 32	23 33	23 34	23 35	23 37
13	....	....	....	23 59	23 58	23 56	23 55	23 54	23 53	23 52	23 51	23 50	23 49
14	0 3	0 2	0 0	....	....	....	....	....	....	....	....	....	....
15	0 48	0 43	0 38	0 32	0 29	0 25	0 21	0 16	0 14	0 11	0 8	0 5	0 2
16	1 32	1 24	1 16	1 6	1 1	0 55	0 48	0 39	0 35	0 31	0 26	0 21	0 15
17	2 16	2 6	1 54	1 42	1 34	1 26	1 16	1 5	0 59	0 53	0 47	0 39	0 31
18	3 1	2 49	2 35	2 19	2 10	2 0	1 48	1 33	1 27	1 19	1 11	1 1	0 51
19	3 48	3 33	3 18	3 0	2 50	2 38	2 24	2 7	1 59	1 50	1 40	1 29	1 16
20	4 35	4 20	4 3	3 44	3 33	3 20	3 4	2 46	2 37	2 27	2 16	2 3	1 49
21	5 24	5 8	4 51	4 31	4 20	4 7	3 51	3 32	3 23	3 13	3 1	2 48	2 32
22	6 12	5 57	5 40	5 21	5 10	4 58	4 43	4 24	4 15	4 6	3 54	3 42	3 27
23	7 0	6 46	6 31	6 14	6 4	5 52	5 39	5 22	5 14	5 5	4 55	4 44	4 31
24	7 48	7 36	7 23	7 8	7 0	6 50	6 38	6 24	6 18	6 10	6 2	5 53	5 43
25	8 34	8 25	8 15	8 3	7 57	7 49	7 40	7 29	7 24	7 19	7 12	7 5	6 58
26	9 20	9 14	9 7	8 59	8 55	8 49	8 43	8 36	8 33	8 29	8 25	8 20	8 15
27	10 6	10 3	9 59	9 56	9 53	9 51	9 48	9 44	9 42	9 41	9 39	9 36	9 34
28	10 52	10 52	10 53	10 53	10 53	10 53	10 54	10 54	10 54	10 54	10 54	10 55	10 55
29	11 39	11 43	11 47	11 52	11 55	11 58	12 1	12 6	12 8	12 10	12 12	12 15	12 18
30	12 29	12 36	12 44	12 53	12 58	13 4	13 11	13 19	13 23	13 28	13 32	13 37	13 43
31	13 22	13 33	13 44	13 57	14 4	14 13	14 23	14 35	14 41	14 47	14 54	15 2	15 11
32	14 18	14 32	14 46	15 3	15 12	15 23	15 36	15 52	15 59	16 7	16 16	16 26	16 39

FOR NORTHERN STATIONS NOT ON THE MERIDIAN OF GREENWICH, AND FOR SOUTHERN STATIONS.

For northern stations not on the meridian of Greenwich.—For longitudes twelve hours or less west from Greenwich obtain the data for the given latitude from Table X for the given date and for the date following; for longitudes twelve hours or less east from Greenwich obtain the data for the given latitude from Table X for the given date and for the date preceding. Subtract the time on the earlier date from the time on the later and multiply the difference by the twenty-fourth part of the longitude in hours and decimals of an hour, positive if west, negative if east. Apply the product as a correction to the time on the given date.

For southern stations.—The instant of moonrise or moonset for any station south of the equator is that of moonset or moonrise, respectively, at a place of the same latitude north of the equator whose longitude is twelve hours different from that at the southern station.

If the southern station be twelve hours or less west from Greenwich, and the phenomenon at that station occurs between noon and midnight, the local astronomical day will be the same at the southern and northern stations. If, however, the phenomenon at the southern station occurs between midnight and noon, the local astronomical day at the northern station will be one day later than at the southern.

If the southern station be twelve hours or less east from Greenwich, and the phenomenon at that station occurs between noon and midnight, the local astronomical day at the northern station will be one less than at the southern station. If, however, the phenomenon occurs between midnight and noon, the local astronomical day will be the same at the two stations.

Having thus determined the true astronomical day at the northern station, compute by the rule for northern latitudes. For the desired local time of moonrise at the southern station change the time of moonset at the northern station twelve hours. For the desired local time of moonset at the southern station change the time of moonrise at the northern station twelve hours.

Example.—December 20, 1919, civil date, find the time of moonrise and moonset in longitude $4^h\ 43^m$ west from Greenwich and in latitude 33° 30′ south.

The longitude of the northern station is $7^h.3$ east from Greenwich and its latitude is 33°.5 N. Upon inspection of Table X it is seen that the astronomical day at the southern station is December 19 for moonrise and December 20 for moonset, the former phenomenon occurring between midnight and noon, the latter between noon and midnight. For the northern station, in accordance with the precepts given above, both phenomena are to be computed for December 20.

	Moonrise.			Moonset.		
At northern station—	d	h	m	d	h	m
Table X, Lat. +33°.5	Dec. 19	17	10	Dec. 19	2	53
Table X, Lat. +33°.5	20	18	0	20	3	36
Difference			50			43
Product of Diff. by $-\frac{7.3}{24}$			−15			−13
Local astronomical mean time		17	45		3	23
At southern station—	Moonset.			Moonrise.		
Local astronomical mean time		5	45		15	23
Civil time	Dec. 20	5	45 P. M.	Dec. 20	3	23 A. M.

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

There are in general use three different kinds of time, True Solar Time—also called Apparent Solar Time—Mean Solar Time, and Sidereal Time.

True or Apparent Solar Time is measured by the diurnal motion of the Sun, the length of the day being the interval between two successive transits of the Sun over the same meridian, and the time of day being the hour-angle of the Sun westward from the meridian. Owing to the obliquity of the ecliptic and to the lack of uniformity of the motion of the Earth in its orbit, the rate of motion of the Sun in hour-angle and the length of the apparent solar day are not constant. Therefore clocks and chronometers can not be regulated to apparent solar time, which may, however, be determined by observations of the Sun when visible.

Mean Solar Time is measured by the motion of a fictitious body called the mean Sun, which is supposed to move uniformly in the celestial equator, completing the circuit in one tropical year. Since mean solar time is uniform and regular in its passage, clocks and watches may be regulated to it, and those in ordinary use are usually so regulated.

Mean solar time can not, of course, be determined by direct observation, but may be determined indirectly by correcting observations of the Sun for the equation of time, or by converting to mean time sidereal time determined by observations of fixed stars.

The Equation of Time is the difference in hour-angle between the true Sun and the mean Sun. The true Sun is sometimes before and sometimes behind the mean Sun by an amount which varies from zero to about 16 minutes. The equation of time is given for Greenwich mean noon on pages 2–16 and for Washington apparent noon on pages 514–521.

The Mean Solar Day is the unit of mean solar time and is equal in length to the mean or average of all the true or apparent solar days of the year. It may be otherwise defined as the interval of time elapsing between two successive transits of the mean Sun across the meridian of any place.

Sidereal Time or star time, in general terms, is measured by the diurnal motion of the fixed stars, or, speaking more precisely, by the diurnal motion of that point on the celestial equator called the vernal equinox, from which the right ascensions of the heavenly bodies are measured. Astronomical clocks regulated to sidereal time are called sidereal clocks. Sidereal time may be determined from observations of stars whose right ascensions are known.

A Sidereal Day is very nearly the length of time in which the Earth rotates on its axis and is accurately defined as the time interval between two successive transits of the vernal equinox over the same meridian. The sidereal day is shorter than the mean solar day by $3^m\ 56^s.555$ sidereal time or $3^m\ 55^s.909$ mean solar time, the tropical year of 365.2422 mean solar days containing

366.2422 sidereal days. Sidereal time and the length of the sidereal day are subject to slight irregularities on account of small differences between the positions of the true and mean equinoxes.

The mean solar and sidereal days are each divided into 24 hours. About March 23 (civil date) of each year, about two days after the vernal equinox, there is an instant when the face of a sidereal clock shows the same time as a mean time clock, and the former gains on the latter $3^m\ 56^s.555$ sidereal time per mean solar day, so that at the end of a year it will have gained one sidereal day and will again agree with the mean time clock.

The Civil Day begins at midnight and comprises 24 hours, the hours being counted from 0 to 12 in two series; the first marked A. M., running from midnight to noon, and the second, marked P. M., running from noon to midnight.

The Astronomical Day begins at noon on the civil day of the same date, the 24 hours being counted from 0 to 24, running from noon of one day to noon of the next following day. Astronomical time as well as civil time may be either apparent or mean. Astronomical time only is used throughout this volume.

The civil day begins twelve hours before the astronomical day; therefore the first half of the civil day coincides with the last half of the preceding astronomical day, and the last half of the civil day coincides with the first half of the astronomical day of the same date. Hence we have the following rules:

To convert Civil Time into Astronomical Time.—If the civil time is marked A. M., take one from the day and add twelve to the hours; if the civil time is marked P. M., take away the designation P. M. Thus, January 9, 2 o'clock, A. M., civil time, is January 8, 14^h, astronomical time; and January 9, 2 o'clock, P. M., civil time, is January 9, 2^h, astronomical time.

To convert Astronomical Time into Civil Time.—If the astronomical time is less than twelve hours, write P. M. after it; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To convert Solar or Sidereal Time of any meridian B to that of another meridian A, add the difference of longitude expressed in time when A is east of B, and subtract the difference of longitude when A is west of B.

Greenwich mean time, which at any fixed observatory is obtained by applying the longitude to the local mean time, on board ship is usually taken from the mean time chronometer set to Greenwich time.

Greenwich mean noon of any date means the noon at the beginning of the astronomical day.

PART I.—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Pages 2–17 contain for Greenwich mean noon of each day the *Sun's Apparent Right Ascension*, *Apparent Declination, Semidiameter, Horizontal Parallax, True Longitude, and Latitude*. They also contain the *Logarithm of the Radius Vector of the Earth*, the *Precession in Longitude*, the *Nutation in Longitude*, the *Aberration*, the *True Obliquity*, the *Equation of Time*, the *Sidereal Time or Right Ascension of Mean Sun*, and the *Mean Time of Sidereal Noon.* Adjoining columns contain, for each Greenwich mean noon, the *Variation per*

Hour for those of the quantities for which it seemed advisable to give a rate of motion. By multiplying any one of those variations by the hours and parts of an hour from Greenwich mean noon and adding the product algebraically to the corresponding quantity at noon, we obtain an approximate value of the quantity in question for any given Greenwich mean time. If great exactness is desired, the value of the hourly variation is found for the time halfway between Greenwich mean noon and the given Greenwich mean time before multiplying by the hours and parts of an hour from Greenwich mean noon.

It is to be noted that here, as elsewhere throughout the volume, the positive sign used with declinations or latitudes indicates north and the negative sign south.

The Sun's *Apparent Right Ascension* and *Declination* are affected both by aberration and by nutation, and therefore denote the *apparent* position of the *true* Sun. The Sun's *True Longitude* is the true geometric longitude not corrected for aberration; it is referred to the true equinox.

The Sun's *Latitude* is referred to the ecliptic of the date.

The Sun's *Declination* is required whenever that body is observed for the purpose of finding latitude, local time, or azimuth.

The Sun's *Semidiameter* is used in reducing the altitude of the upper or lower limb of the Sun to the altitude of the center; and in reducing the angular distance between the limb of the Sun and any other object to the distance from the center of the Sun.

The *Horizontal Parallax* is the angle subtended by the equatorial radius of the Earth, as seen from the center of the Sun.

The *Precession in Longitude* is the quantity to be applied to the longitude of the Sun referred to the mean equinox of the beginning of the Besselian fictitious year, i. e., the instant when the Sun's mean longitude is 280°, in order to refer it to the mean equinox of date.

The *Nutation in Longitude* is the quantity to be applied to the longitude of a body referred to the mean equinox of date in order to refer it to the true equinox, short-period terms being neglected.

The *Aberration* is the quantity to be subtracted from the true longitude of the Sun in order to obtain its apparent longitude.

The *True Obliquity* is the inclination of the Earth's equator to the ecliptic, short-period terms being neglected.

The corrections to the values of the nutation and the obliquity here given, to take account of the short-period terms, may be found on pages 215–216.

The *Equation of Time* is the apparent time of Greenwich mean noon, or the hour angle of the true Sun at that instant. When interpolated to any given Greenwich mean time, it is the correction to be applied to mean time in order to obtain apparent time.

The *Sidereal Time of Mean Noon* is the right ascension of the mean Sun at Greenwich mean noon. It may be reduced for the longitude or to any Greenwich mean time by using the hourly variation, $+9^{s}.8565$; or by Table III, page 687 of this volume, for reducing intervals of mean time to sidereal time. It is useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the right ascension of the mean Sun for that time and this being added to the local astronomical mean time, i. e., the hour angle of the mean Sun, will give the hour angle of the vernal equinox, or the sidereal time required.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time gives the interval of sidereal time past noon, and that is converted into the required mean time by subtracting from it the corresponding reduction of a sidereal interval to a mean-time interval, taken from Table II, page 684 of this volume. If the sidereal interval is less than $3^m\ 56^s.555$, there are two mean times corresponding to the given sidereal time, one a few minutes after the preceding noon, and the other a few minutes before the following noon, the mean-time interval between these two mean times being $23^h\ 56^m\ 4^s.09$. The mean time, approximately known, will always show which one is to be taken. Instead of using Table II the reduction of a sidereal to a mean-time interval may be found by multiplying $-9^s.8296$ by the hours and parts of an hour of the sidereal interval.

The *Mean Time of Sidereal Noon* is the number of hours, minutes, and seconds after Greenwich mean noon when the vernal equinox passes the meridian of Greenwich; it may be reduced to any other meridian by using the hourly variation, $-9^s.8296$, to effect the necessary interpolation, or the reduction may be taken directly from Table II. In the same way the reduction may be made to any Greenwich sidereal time, and the result will then represent $24^h -$ Right Ascension of the Mean Sun. This column may be conveniently used for converting sidereal to mean time, or—which is the same problem—for finding the time of meridian passage of a star whose right ascension is known, by adding to the mean time of the *preceding* local sidereal noon, the mean time equivalent of the given sidereal time.

As examples of the use of pages 2–17:

1. Let the Sun's declination be required for April 14, 1919, $2^h\ 5^m\ 20^s$, P. M., at a place whose longitude is 58° 20′, or $3^h\ 53^m\ 20^s$ west from Greenwich:

		h	m	s
Local mean time	April 14,	2	5	20
Longitude from Greenwich (additive)		3	53	20
Greenwich mean time	April 14,	5	58	40

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $5^h.978$ after Greenwich mean noon on April 14, or $18^h.022$ before Greenwich mean noon on April 15.

On page 6 of the Ephemeris we find that the variation of declination per hour is:

	″
At Greenwich mean noon, April 14	+54.28
At Greenwich mean noon, April 15	+53.89
Difference for one day	− 0.39

If great exactness is desired, we find the amount of this hourly variation for the time halfway between Greenwich noon and the time of observation: that is, for 3 hours after Greenwich noon of the 14th, this being half of 6 hours. *Three hours* is 0.125 of a day; so the calculation is as follows:

		″
Variation at Greenwich mean noon, April 14		+54.28
Change in 0.125 of a day	$-0''.39 \times 0.125$	− 0.05
Variation at 3 hours after noon		+54.23
		° ′ ″
Declination at Greenwich noon, April 14		+9 7 29.6
Change in 5.978 hours	$+54''.23 \times 5.978$	+ 5 24.2
Sun's declination at time of observation		+9 12 53.8

With equal facility the computation might have been made backward from the succeeding noon. Thus in the example just given the time is $18^{h}.022$ before Greenwich noon of April 15; half this interval is about 0.375 of a day, and the hourly motion for the middle of the interval is $+54''.04$. Then we find:

		° ′ ″
Declination at Greenwich noon, April 15		+9 29 7.7
Change in −18.022 hours	$+54''.04 \times -18.022$	− 16 13.9
Sun's declination at time of observation		+9 12 53.8

It will always be well to make the calculation in both ways, as a check; but if the results differ slightly the one derived from the nearest noon should be regarded as the more accurate.

2. Let the Sun's right ascension and the equation of time be required for July 13, 1919, $10^{h}\ 3^{m}\ 30^{s}$, A. M., mean time, at a place whose longitude is 85° 15′, or $5^{h}\ 41^{m}$ west from Greenwich.

		h m s	h
Local astronomical mean time	July 12,	22 3 30	
Longitude from Greenwich (additive)		5 41 0	
Greenwich mean time	July 13,	3 44 30	=3.7417

		Sun's Right Ascension.		*Equation of Time.*
		h m s		m s
Greenwich noon, July 13		7 26 41.42		−5 25.21
Change in 3.7417 hours	$10^{s}.166 \times 3.7417$	+38.04	$-0^{s}.310 \times 3.7417$	− 1.16
		7 27 19.46		−5 26.37

In this case the hourly variations interpolated to half the interval, or $1^{h}.87$ after noon, have been used.

3. If the sidereal time is required for the same time and place, we have:

	h m s
Sidereal time at Greenwich mean noon, July 13	7 21 16.21
Reduction for $3^{h}\ 44^{m}\ 30^{s}$ from Table III, or $9^{s}.8565 \times 3.7417$	+ 36.88
Add the local astronomical mean time	22 3 30.00
The required sidereal time (rejecting 24^{h})	5 25 23.09

4. On July 13, 1919, A. M., at a place whose longitude is 85° 15′ W., suppose the sidereal time to be $5^{h}\ 25^{m}\ 23^{s}.09$ and that the corresponding mean time is required.

The astronomical day is July 12; the longitude in time, $+5^h\ 41^m\ 0^s$, or $+5^h.6833$.

First solution.

	h	m	s	
Sidereal time at Greenwich mean noon . . July 12,	7	17	19.65	
Reduction for $5^h\ 41^m\ 0^s$ from Table III, or $9^s.8565 \times 5.6833$.			+56.02	
The sidereal time at local mean noon, July 12 . . .	7	18	15.67	
The given sidereal time ($+24^h$, if necessary for the following subtraction)	29	25	23.09	
Subtracting the first from the second gives the sidereal interval from noon	22	7	7.42	$=22^h.1187$
Reduction for $22^h\ 7^m\ 7^s.42$ from Table II, or $-9^s.8296 \times 22.1187$		−3	37.42	
The required astronomical mean time . . . July 12,	22	3	30.00	

Second solution.

	h	m	s
Mean time at Greenwich sidereal noon . . July 12,	16	39	56.08
Reduction for longitude from Table II, or $-9^s.8296 \times 5.6833$.			−55.86
Mean time of *preceding* local sidereal noon . . July 12,	16	39	0.22
Add the given sidereal time	5	25	23.09
Reduction for $5^h\ 25^m\ 23^s.09$ from Table II, or $-9^s.8296 \times 5.4231$			−53.31
The required astronomical mean time . . . July 12,	22	3	30.00

If there is any doubt about the mean time of the *preceding* local sidereal noon, the first solution is to be preferred.

Pages 18–25 contain the rectangular coordinates of the Sun, referred to the center of the Earth as the origin, and to the true equator and equinox as the plane and point of reference. Each coordinate is given for every Greenwich mean noon and midnight. The columns *Reduc. to Mean Eq'x of 1919.0* give the corrections to be applied to the coordinates for noon in order to obtain the corresponding coordinates referred to the mean equator and equinox of the beginning of the Besselian fictitious year.

Pages 26–117 contain *The Moon's Right Ascension* and *Declination* for each day and hour of Greenwich mean time, referred to the true equator and equinox. They are accompanied by columns of *Variations per Minute*, by means of which interpolation may be conveniently made to any moment of Greenwich mean time. The right ascension or declination is taken out for the given day and hour of Greenwich mean time; the *Var. per Min.* is multiplied by the minutes and parts of a minute of the Greenwich time, and the product is added numerically in case of the right ascension and algebraically in case of the declination.

Thus, suppose the Moon's right ascension and declination are required for January 25, 1919, $10^h\ 10^m\ 30^s$, astronomical mean time at Greenwich:

		Right Ascension. h m s		*Declination.* ° ′ ″
January 25, 10^h		15 23 37.37		−20 14 44.3
Change in 10.5 minutes .	$2^s.0994 \times 10.5$	22.04	$-5''.016 \times 10.5$	−52.7
January 25, $10^h\ 10^m\ 30^s$		15 23 59.41		−20 15 37.0

For the sake of precision the differences here employed have been interpolated for $5^m.2 = 0^h.09$.

Page 117 contains also the *Phases of the Moon* and the dates of the *Moon's Apogee* and *Perigee*, or greatest and least distances from the Earth.

Pages 118–133 contain for every Greenwich mean noon and midnight the *Moon's Longitude* and *Latitude* referred to the true equinox and the ecliptic, its *Semidiameter*, and its *Equatorial Horizontal Parallax.* The column adjoining that of the horizontal parallax gives the variation of that quantity per hour, by means of which it can be reduced to any other Greenwich mean time in the manner shown in the preceding examples. When allowing for change in the variation itself, note must be taken of the fact that the tabular interval is here 12 hours instead of 24. The quantity thus obtained is the equatorial horizontal parallax; to obtain the horizontal parallax at any given place, the correction for the latitude of the place must be applied. The reduction of the Moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.2725 (see page xi), or by simply computing the proportional part.

If, for example, the semidiameter of the Moon is to be taken out for March 10, 1919, 7^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of March 10 is 4″.8; then,

$$12^{h} : 7^{h} = 4''.8 : 2''.8$$

which is the correction to be subtracted from the semidiameter at noon, because the semidiameter is decreasing. The Moon's semidiameter for March 10, 7^{h}, is therefore 15′ 43″.9.

The Moon's semidiameter and horizontal parallax are required for all observations of the Moon.

Pages 118–133 contain also: The *Moon's Age*, or the time elapsed since the preceding new Moon, given to tenths of a day; the mean time of the *Moon's Transit, Upper* and *Lower*, at Greenwich, given to tenths of a minute; and the *Variation per Hour* of the latter quantity, that is, the variation for one hour of longitude, by means of which the local time of an upper or lower transit of the Moon may be computed for any place whose longitude is known.

Pages 134–198 contain for each of the seven major planets the geocentric ephemeris followed immediately by the heliocentric ephemeris.

The geocentric ephemeris gives the planet's *Apparent Right Ascension* and *Apparent Declination* with the respective *Variations per Hour* or *per Day.* The positions thus given are referred to the true equator and equinox, and are corrected for aberration. The geocentric ephemeris gives also the *Logarithm of Distance from Earth* with the *Variation per Hour* or *per Day*, the planet's *Semidiameter* and *Horizontal Parallax*, and, to tenths of a minute, the time of *Transit Meridian of Greenwich.* All the data, except the last named, are given for Greenwich mean noon.

The right ascension and declination of a planet are required whenever it is observed for time, latitude, or azimuth. The mode of reducing the ephemeris positions of planets to other instants of Greenwich mean time is the same as that already given for the Sun. The local mean time of meridian transit of any planet at any place can be found by dividing the proper daily difference of the ephemeris times by 24, multiplying the quotient by the longitude of the place expressed in hours and fractions, and applying the product with its proper sign to the time of Greenwich transit.

The heliocentric ephemeris gives the *Heliocentric Longitude*, *Mean Equinox of Date;* the *Heliocentric Latitude;* and the Logarithm of Radius Vector; with their respective *Variations per Day*. The heliocentric longitude may be referred to the true equinox by applying nutation. The variations are given for the instant of Greenwich mean noon. The column ***Reduction to Orbit*** contains the correction to be applied to the heliocentric longitude in order to obtain the longitude measured along the orbit of the planet. This orbit longitude is equal to the distance from the mean equinox to the node, plus the distance from the node to the planet. The heliocentric latitude is referred to the ecliptic of the date. The *Logarithm of Radius Vector* is the logarithm of the distance of the center of the planet from that of the Sun.

PART II.—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Pages 200–201 contain formulæ for reducing mean positions of stars to apparent positions, including expressions for the Besselian star-numbers and star-constants, and for the independent star-numbers; the whole based upon the constants of the Paris Conference of May, 1896, and expressed in the notation of BESSEL.

Pages 202–205 contain the logarithms of the *Besselian Star-Numbers*, A, B, C, D, for each Washington mean midnight, with the values of E appended at the bottoms of the pages. The terms of short period have been included. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at any of the dates for which the numbers are given, and in ordinary cases four-figure logarithms suffice; but where extreme accuracy is desired the logarithms of A, C, and D are sometimes needed to five places of decimals. Along with the solar day, the first column contains the sidereal hour of Washington mean midnight for certain dates, and by interpolation among them it is easy to find the sidereal time for which any set of quantities is given.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:

Computation of the apparent place of 2 Aquilæ, May 26, 1919, for the upper transit at Washington.

$\log a$	0.5165	$\log b$	7.2458 *n*	$\log c$	8.0452	$\log d$	8.8235 *n*
$\log A$	9.8375	$\log B$	0.6351	$\log C$	0.9002 *n*	$\log D$	1.2683 *n*
$\log a'$	0.5178	$\log b'$	9.9940	$\log c'$	9.4341	$\log d'$	8.4164 *n*
$\log Aa$	0.3540	$\log Bb$	7.8809 *n*	$\log Cc$	8.9454 *n*	$\log Dd$	0.0918
$\log Aa'$	0.3553	$\log Bb'$	0.6291	$\log Cc'$	0.3343 *n*	$\log Dd'$	9.6847

		h	m	s		°	′	″
Mean Place, 1919.0	α_0	18	37	50.390	δ_0	−9	7	52.09
	Aa			+2.259	Aa'			+2.27
	Bb			−0.008	Bb'			+4.26
	Cc			−0.088	Cc'			−2.16
	Dd			+1.235	Dd'			+0.48
	E			+0.002	$\tau\mu'$			0.00
	$\tau\mu$			+0.001				
Apparent Place, May 26,	α	18	37	53.791	δ	−9	7	47.24

Pages 206–213 contain the *Independent Star-Numbers*, which can frequently be advantageously used instead of the *Besselian Star-Numbers*. The terms of *short period* have been included. These quantities are connected with those of Bessel by the relations given on page 200, which also contains the formulæ

and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants, $a, b, c, d, a', b', c', d'$, while the independent star-numbers render it possible to determine the apparent place of a star without computing these star-constants. Four-figure logarithms usually suffice, but where extreme accuracy is desired the logarithms of g and h are needed to five places of decimals, and G and H are needed to one-tenth of a minute of arc. The column τ gives the fraction of a year, counted from the beginning of the Besselian fictitious year to each date.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:

Computation of the apparent place of 2 Aquilæ, May 26, 1919, for the upper transit at Washington.

	h m		° ′
$G=$	1 9.6	$\delta_0=$	− 9 7.9
$\alpha_0=$	18 37.8	$G+\alpha_0=$	$19^h\ 47^m.4$
$H=$	13 32.7	$H+\alpha_0=$	8 10.5

					h m s
$\log \frac{1}{15}$	8.8239	$\log \frac{1}{15}$	8.8239	α_0	18 37 50.390
$\log g$	1.1598	$\log h$	1.3049	$f+f'$	+2.116
$\log \sin (G+\alpha_0)$	9.9505 n	$\log \sin (H+\alpha_0)$	9.9254	(g)	+0.138
$\log \tan \delta_0$	9.2061 n	$\log \sec \delta_0$	0.0055	(h)	+1.147
$\log (g)$	9.1403	$\log (h)$	0.0597	$\tau\mu$	+0.001
				α	18 37 53.792
					° ′ ″
$\log g$	1.1598	$\log h$	1.3049	δ_0	− 9 7 52.09
$\log \cos (G+\alpha_0)$	9.6548	$\log \cos (H+\alpha_0)$	9.7317 n	(g')	+6.53
$\log (g')$	0.8146	$\log \sin \delta_0$	9.2006 n	(h')	+1.73
		$\log (h')$	0.2372	(i)	−3.40
$\log i$	0.5374 n			$\tau\mu'$	0.00
$\log \cos \delta_0$	9.9945				
$\log (i)$	0.5319 n			δ	− 9 7 47.23

Page 214 contains for every tenth sidereal day the *Besselian* and *Independent Star-Numbers*, exclusive of all short-period terms. They are useful in computing ephemerides of stars, similar to those on pages 316–513, for which data containing short-period terms should not be employed.

Pages 215–216 contain for Washington mean midnight of each day the short-period terms of the nutation in longitude and obliquity, for use in connection with the formulæ on page 201, and the coefficients mentioned later, which are given for each star on pages 316–513.

Pages 217–230 contain the *Mean Places of Ten-day Stars* for the beginning of the Besselian fictitious year. These pages give also the magnitude, spectral type, annual variations, and proper motions for each star. The annual variations are to be considered as the differential coefficients of each coordinate with respect to the time at the beginning of the year.

Page 231 contains, for the *Circumpolar Stars*, the same data as the immediately preceding pages do for the ten-day stars.

Pages 232–315 contain for every upper transit at Washington the apparent positions of seventeen northern and eighteen southern circumpolar stars arranged in the order of their right ascensions. The mean solar time of transit is given in the column *Washington Mean Time*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26 is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 232 we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But the lower transit of July 1 precedes the upper one, which occurs July 1.8. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column *Washington Mean Time.*

The secant and tangent of the apparent declination for the 15th of each month and the mean place in right ascension and declination for the beginning of the year are given for each star at the foot of the page.

Pages 316–513 contain, for every tenth upper transit at Washington, the apparent places of 790 stars, being all those given in the list of mean places of ten-day stars. The *Washington Mean Time* in the left-hand column of each page gives the day and tenth of the transit, so that intermediate transits may be readily identified; and to facilitate interpolation, the differences of each coordinate are given for every ten days.

In connection with the ephemeris of each ten-day star there are given at the foot of the page (1) the seconds of the mean place in both right ascension and declination for the beginning of the year, (2) the secant and the tangent of the mean of the star's greatest and least apparent declinations during the year, and (3) the coefficients of the short-period terms of the nutation, the use of which is explained on page 201.

Pages 514–521 contain, for Washington apparent noon, the *Apparent Right Ascension* and *Declination* of the Sun, the *Equation of Time,* and the *Variation per Hour* of these quantities; the *Semidiameter* of the Sun, and the *Sidereal Time of Semidiameter Passing Meridian.* The last column on each page contains the *Sidereal Time of Mean Noon.*

The *Equation of Time, Mean–App.* is the correction to be applied to apparent time in order to obtain mean time. Each number as given is the mean time of transit of the Sun's center over the meridian of Washington counted from the nearest noon.

Pages 522–537 contain the *Right Ascension of Center,* the *Geocentric Declination of Center,* the *Sidereal Time of Semidiameter Passing Meridian,* the *Geocentric Semidiameter,* and the *Equatorial Horizontal Parallax* of the Moon, and the *Washington Mean Time* at the moment of each upper and lower transit over the meridian of Washington.

The *Variation per Hour of Longitude* is the correction to be applied in each case to the quantity in the preceding column to obtain its value for the time of transit over the meridian one hour west of Washington, supposing the rate of change to be uniform and equal to what it is at the instant of transit over the meridian of Washington. The quantities in the third column, when corrected for another longitude by the hourly variations, give the local mean time of transit for that longitude. By means of the variations per hour of longitude any one of the quantities under consideration can be computed with great exactness for the moment of transit over any meridian not more than one hour distant from Washington. To obtain the same accuracy for more distant meridians, we may proceed as follows: Let F represent either the *Washington Mean Time*, the *Right Ascension of Center*, or the *Geocentric Declination of Center*, and let V represent the corresponding *Variation per Hour of Longitude*. Write down three successive values of F, together with the corresponding values of V, and difference the latter as in the following scheme, where the middle values, F_0 and V_0, belong to the culmination from which is to be derived the value of F for the culmination on the meridian whose longitude is λ:—

Function.	Var. per Hour of Longitude.	Δ′	Δ″
F_{-1}	V_{-1}	a'	
F_0	V_0	a''	b
F_{+1}	V_{+1}		

Then, for the culmination at the meridian λ

$$F_\lambda = F_0 + \lambda V_0 + \frac{\lambda^2}{48}(a' + a'') + \frac{\lambda^3 b}{864}$$

where λ must be expressed in hours and decimals of an hour, and reckoned from Washington or from 180° from Washington according as the upper or lower culmination is used for the middle value (F_0). Adding twelve hours to the Washington time of lower transit at Washington gives the local time of upper transit at places whose longitude is 180° from Washington.

The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When one limb is full and the terminator is within 1″ of the opposite limb, both can be well observed, and in such cases both are indicated, the defective limb being indicated by an italic letter or numeral, and the correction for defective illumination (as seen from Washington) being given in a footnote.

Pages 538–553 contain for six of the major planets, the geocentric *Apparent Right Ascension* and *Declination*, the *Horizontal Parallax*, *Semidiameter*, *Sidereal Time of Semidiameter Passing Meridian*, and the *Washington Mean Time*, for the moments of all transits which it is usually desirable to observe over the meridian of Washington. The stellar magnitude at opposition for Jupiter, Saturn, Uranus, and Neptune, respectively, is given at the bottom of the page containing the ephemeris of the planet.

PART III.—PHENOMENA.

This part gives the dates of the principal astronomical phenomena of the year, expressed in Greenwich mean time, except in the case of the occultations visible at Washington, where Washington time is used.

Pages 556–563 contain all necessary data respecting the solar and lunar eclipses which occur during the year.

The eclipse elements are given for the moment of conjunction of the Sun and Moon in right ascension, but the subsequent tables and results are computed from the exact positions of these bodies at the several instants referred to. The times and angles designated as the circumstances of a lunar eclipse remain the same throughout all parts of the Earth, and require no explanation beyond a mere statement of the fact that in computing them the geometrical diameter of the Earth's shadow has been augmented in the proportion of 51:50. The principal circumstances of each total and annular eclipse of the Sun are stated in five lines, as follows:—

The line entitled "Eclipse begins" gives the Greenwich mean time at which the Moon's penumbra first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse begins" gives the time when the axis of the Moon's shadow first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse at local apparent noon" gives the time when the axes of the Earth and of the shadow cone lie in the same plane, together with the latitude and longitude of the point where the axis of the shadow cone then cuts the Earth's surface.

The lines entitled "Central eclipse ends" and "Eclipse ends" give, respectively, the times when and the localities where these events occur, the phenomena being the converse of those denoted by the similar phrases for the beginning.

In the case of partial solar eclipses the axis of the Moon's shadow does not come into contact with the Earth, and the three lines entitled, respectively, "Central eclipse begins," "Central eclipse at local apparent noon," and "Central eclipse ends," are replaced by a single line entitled "Greatest eclipse," whereon are given the time when and the latitude and longitude where the eclipse attains its greatest magnitude. The latter phenomenon necessarily occurs with the Sun in the horizon.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the map relating to it, from which may be taken approximately, for any place, both the times of the beginning and ending of the eclipse and its magnitude. The dotted curves show the outline of the shadow for each hour of Greenwich mean time, and therefore pass through all places where the eclipse begins or ends at the hour indicated. To find the instant of beginning at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between the corresponding hours of Greenwich mean time; and the fraction of the hour may be determined by dividing the hour in the same proportion as the space representing it on the map is divided by the place in question. This division may be made a little more exact by allowing for changes in the spaces as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the times at which the eclipse of November 22, 1919, begins and ends at the place whose latitude is $-10°$ and whose longitude is $+50°$.

For the beginning we compare the distance of the place from the curves of 1^h and 2^h and find it to correspond to about 35 minutes from the former, thus giving for the approximate time of beginning 1^h 35^m; for the end we compare the distance of the place from the curves of 5^h and 6^h and find it to correspond to about 13 minutes from the former, thus giving for the approximate time of ending, $5^h 13^m$; and both of these results are probably correct to within 3 or 4 minutes.

Changing to local mean time, we shall have—

		Beginning. d h m	Ending. d h m
Greenwich mean time . .	November	22 1 35	22 5 13
Longitude west		3 20	3 20
Local Mean Time	November	21 22 15	22 1 53

In the case of total and annular eclipses, a fair estimate of the magnitude of the eclipse at any place may be obtained from the position thereof relative to the central line and to the limit. On the central line the eclipse is annular or total, while between the central line and the limit the maximum magnitude of the eclipse is given by the quotient of the distance of the place from the limit divided by the distance of the central line from the limit, the measurements being made upon a line drawn through the place perpendicularly to the central line.

More Accurate Computations.—A more accurate determination of the phases, as visible at any point of the Earth's surface, may be obtained from the Besselian elements which are given for every 10 minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the center of the Earth, perpendicular to the right line joining the centers of the Sun and Moon. This latter line is the axis of the Moon's shadow, and the plane is called the *fundamental plane* or plane of xy. We take the intersection of this plane with that of the Earth's equator as the axis of x, and the center of the Earth as the origin of coordinates. The axis of y is perpendicular to that of x, and directed toward the north; x and y are then the coordinates of the point in which the axis of the shadow intersects the fundamental plane, and they are here expressed in terms of the Earth's equatorial radius as unity. The angle d, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; or, in other words, it is the declination of the center of the Sun as seen from the center of the Moon. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l_1 and l_2 are the radii of the shadow cones upon the fundamental plane, l_1 corresponding to the penumbra, and l_2 to the umbra. The notation is that of CHAUVENET'S *Spherical and Practical Astronomy*, in which l_2 is regarded as positive for an annular and negative for a total eclipse.

The angles f_1 and f_2, the tangents of which are given, are the angles which the elements of the respective shadow cones make with the axis of the shadow; or, they are the semiangles of the two cones.

In order to facilitate interpolation to any required moment, the logarithms of x', y', and μ', which are the changes of x, y, and μ, in one minute of time, are given at the bottom of the table.

The method of computing an eclipse from its Besselian elements is based on the fact that the distance of the observer from the axis of the shadow cones is equal to the radius of the penumbra at the point of observation for the beginning and ending of the eclipse, and is equal to the radius of the umbra at the point of observation for the beginning and ending of totality or of the annular phase. To find this distance and radius in each case we proceed as follows:

(1) The coordinates of the observer, ξ, η, and ζ, together with their variations in one minute, are computed for some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase.

(2) The coordinates x and y of the axis of the shadow, together with their variations in one minute, are taken for the same moment from the tables of elements.

(3) From (1) and (2) the position and motion of the observer relative to the axis of the shadow are found.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer is also computed.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follows:—

(1) Find $\rho \cos \varphi'$ and $\rho \sin \varphi'$, which are the geocentric coordinates of the station referred to the Earth's equator, ρ being the distance from the center of the Earth and φ' the geocentric latitude. These coordinates may be computed from the following table based on the compression of the Earth adopted at the Paris Conference of 1911, 1/297, by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Coordinates of a Place.

φ	Log F.		Log G.	
0°	0.00000		0.00293	
5	0.00001	1	0.00292	1
10	0.00004	3	0.00289	3
15	0.00010	6	0.00283	6
20	0.00017	7	0.00276	7
25	0.00026	9	0.00267	9
30	0.00037	11	0.00256	11
35	0.00048	11	0.00245	11
40	0.00060	12	0.00232	13
45	0.00073	13	0.00220	12
50	0.00086	13	0.00207	13
55	0.00098	12	0.00195	12
60	0.00110	12	0.00183	12
65	0.00120	10	0.00173	10
70	0.00129	9	0.00164	9
75	0.00137	8	0.00156	8
80	0.00142	5	0.00151	5
85	0.00145	3	0.00148	3
90	0.00146	1	0.00146	2

For the assumed Greenwich mean time of computation, take from the table of elements the values of sin d, cos d, and μ. Then, with λ for the longitude west from Greenwich, the coordinates of the observer will be—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$
$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) = \eta_1 - \eta_2$$
$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda) = \zeta_1 + \zeta_2$$

and their variations in one minute of mean time will be—

$$\xi' = [7.63992]\, \rho \cos \varphi' \cos (\mu - \lambda)$$
$$\eta' = [7.63992]\, \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992]\, \xi \sin d$$

ζ' is not needed.

(2) For the same assumed moment of Greenwich mean time, take from the tables of elements the coordinates x and y of the axis of the shadow, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. These variations are represented by x' and y', and their logarithms are given beneath the tables of x and y.

(3) The distance m and position-angle M of the axis of the shadow relative to the observer, and the relative motions, n and N, are computed by the formulæ—

$$m \sin M = x - \xi$$
$$m \cos M = y - \eta$$
$$n \sin N = x' - \xi'$$
$$n \cos N = y' - \eta'$$

(4) Both for the umbra and for the penumbra, the radius L at the distance ζ from the fundamental plane is computed by the formulæ—

$$L = l - \zeta \tan f$$

l and f being taken from the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or ending of the eclipse, we shall have—

$$m = L$$

But, as this condition will rarely be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation—

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values for this angle; the one for which cos ψ is negative must be taken for the beginning of the eclipse, for the beginning of the annular phase, or for the ending of the total phase, but the one for which cos ψ is positive must be taken for the ending of the eclipse, for the ending of the annular phase, or for the beginning of the total phase. The correction τ to the assumed time will then be found, in minutes, from—

$$\tau = -\frac{m \cos (M - N)}{n} + \frac{L \cos \psi}{n}$$

However, only in case the value of τ does not exceed a few minutes can the time thus corrected be considered even fairly accurate. Therefore it is best to commence the computation by assuming times near the phenomena wanted. The times for the beginning and the ending of an eclipse may be derived from the chart with sufficient exactness as previously explained; the time for the total or for the annular phase may then be assumed as midway between the times assumed for the beginning and the ending of the eclipse; or, in case of a partial eclipse, this time midway may be assumed as that of the maximum eclipse.

The more accurate times resulting from the computation as outlined above and as illustrated in the example below may now be taken in place of those originally assumed, and the whole computation may be repeated, thus leading to a value of τ in each case, which should be very small, and which should give a very accurate time of the phenomenon. Such a repetition of the computation will be advisable, moreover, for the reason that it will enable one to locate and eliminate any accidental numerical errors that may have occurred in the first computation.

As a result of this last approximation the computed times of contact will be theoretically exact within less than a second, but the uncertainties of the solar and lunar tables are such that an unavoidable error of several seconds may exist in the prediction.

Position-angle of Point of Contact.—The position-angle P, of the point of contact, reckoned from the north point of the Sun's limb toward the east, is found by the formula—

$$P=N+\psi$$

where the results of the last approximation are used.

The position-angle V, of the point of contact, reckoned from the vertex of the Sun's limb toward the east, is found by the formula—

$$V=P-C$$

where C is obtained from

$$\tan C=\frac{\xi}{\eta}$$

sin C having the same algebraic sign as ξ, and the results of the last approximation again being used.

Time of Maximum Eclipse.—For a partial eclipse, or for a central eclipse at a point at which the eclipse is only partial indicated by sin ψ greater than unity for the umbra, the correction to the assumed time to obtain the time of maximum eclipse is given by the formula—

$$\tau=-\frac{m\cos(M-N)}{n}$$

Magnitude of the Maximum Eclipse.—This is given by the formula—

$$D^{*}=\frac{L-\Delta}{2L-0.5446}$$

where $\Delta=\pm m\sin(M-N)$, always taken positive, and L is the radius of the penumbra. D is, in all cases, the ratio to the Sun's diameter of the straight line passing through the centers of the two disks and having for its extremities the Sun's limb that is nearest to the Moon's center and the Moon's limb that is nearest to the Sun's center. In a partial eclipse D is the fraction of the Sun's diameter covered by the Moon.

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*Since, in obtaining this formula, the angles of the two shadow cones are considered the same, the value obtained therefrom should be increased by [illegible]th of itself.

Computation of the Solar Eclipse of November 22, 1919, for Havana, Cuba.

The position of Havana is—

	° ′ ″
Latitude, $\varphi =$	+23 9 21
Longitude, $\lambda =$	+82 21 30

and its geocentric coordinates are—

$\rho \sin \varphi' = 9.59194$
$\rho \cos \varphi' = 9.96374$

From the eclipse chart we find the approximate times of the phases to be—

		d h m	
Beginning	Nov.	22 0 20	Greenwich Mean Time.
Middle		22 1 50	
Ending		22 3 20	

	Beginning.	Middle.	Ending.
T Nov. 22	$0^h\ 20^m$	$1^h\ 50^m$	$3^h\ 20^m$
	° ′ ″	° ′ ″	° ′ ″
μ	8 29 42	30 59 36	53 29 30
λ	82 21 30	82 21 30	82 21 30
$\mu-\lambda$	−73 51 48	−51 21 54	−28 52 0
$\log \rho \cos \varphi'$	9.96374	9.96374	9.96374
$\log \sin (\mu-\lambda)$	9.98254n	9.89273n	9.68374n
$\log \xi$	9.94628n	9.85647n	9.64748n
$\log \cos d$	9.97305	9.97301	9.97297
$\log \rho \sin \varphi'$	9.59194	9.59194	9.59194
$\log \sin d$	9.53359n	9.53387n	9.53415n
$\log \eta_1$	9.56499	9.56495	9.56491
$\log \zeta_1$	9.12553n	9.12581n	9.12609n
$\log \sin d$	9.53359n	9.53387n	9.53415n
$\log \rho \cos \varphi'$	9.96374	9.96374	9.96374
$\log \cos (\mu-\lambda)$	9.44394	9.79544	9.94238
$\log \cos d$	9.97305	9.97301	9.97297
$\log \eta_2$	8.94127n	9.29305n	9.44027n
$\log \zeta_2$	9.38073	9.73219	9.87909
η_1	+0.36727	+0.36724	+0.36721
$-\eta_2$	+0.08735	+0.19636	+0.27559
ζ_1	−0.13352	−0.13360	−0.13369
ζ_2	+0.24029	+0.53975	+0.75698
ζ	+0.10677	+0.40615	+0.62329
$\log \rho \cos \varphi'$	9.96374	9.96374	9.96374
$\log \cos (\mu-\lambda)$	9.44394	9.79544	9.94238
log const.	7.63992	7.63992	7.63992
$\log \xi$	9.94628n	9.85647n	9.64748n
$\log \sin d$	9.53359n	9.53387n	9.53415n
$\log \xi'$	7.04760	7.39910	7.54604
$\log \eta'$	7.11979	7.03026	6.82155
x	−1.39590	−0.64649	+0.10307
ξ	−0.88365	−0.71857	−0.44410
$x-\xi$	−0.51225	+0.07208	+0.54717
y	+0.62330	+0.53430	+0.44578
η	+0.45462	+0.56360	+0.64280
$y-\eta$	+0.16868	−0.02930	−0.19702
x'	+0.008325	+0.008327	+0.008329
ξ'	+0.001116	+0.002507	+0.003516
$x'-\xi'$	+0.007209	+0.005820	+0.004813
y'	−0.000992	−0.000986	−0.000981
η'	+0.001318	+0.001072	+0.000663
$y'-\eta'$	−0.002310	−0.002058	−0.001644

	Beginning.	Middle.	Ending.
$\log m \sin M$	9.70948n	8.85781	9.73813
$\log$ sin or cos M	9.97765n	9.96679	9.97353
$\log m \cos M$	9.22707	8.46687n	9.29451n
$\log \tan M$	0.48241n	0.39094n	0.44362n
$\log n \sin N$	7.85788	7.76492	7.68242
$\log$ sin or cos N	9.97878	9.97442	9.97604
$\log n \cos N$	7.36361n	7.31345n	7.21590n
$\log \tan N$	0.49427n	0.45147n	0.46652n
	° ′ ″	° ′ ″	° ′ ″
M	288 13 36	112 7 18	109 48 8
N	107 46 1	109 28 27	108 51 31
$M-N$	180 27 35	2 38 51	0 56 37
$\log m$	9.73183	8.89102	9.76460
$\log n$	7.87910	7.79050	7.70638
$\log \zeta$	9.02845	9.60869	9.79469
$\log \tan f$	7.67540	7.67324	7.67541
$\log \zeta \tan f$	6.70385	7.28193	7.47010
l	+0.57397	+0.02799	+0.57409
$\zeta \tan f$	+0.00051	+0.00191	+0.00295
L	+0.57346	+0.02608	+0.57114
$\log m$	9.73183	8.89102	9.76460
$\log \sin (M-N)$	7.90437n	8.66456	8.21665
colog L	0.24150	1.58369	0.24326
$\log \sin \psi$	7.87770n	9.13927	8.22451
	° ′ ″	° ′ ″	° ′ ″
ψ	180 25 56	172 4 45 7 55 15	0 57 39
$\log m/n$	1.85273	1.10052	2.05822
$\log \cos (M-N)$	9.99999n	9.99954	9.99994
log (1)	1.85272n	1.10006	2.05816
$\log L$	9.75850	8.41631	9.75674
$\log \cos \psi$	9.99999n	(∓)9.99584	9.99994
colog n	2.12090	2.20950	2.29362
log (2)	1.87939n	(∓)0.62165	2.05030
−(1)	+71.240	−12.591	−114.329
+(2)	−75.752	∓ 4.185	+112.279
	m	m	m
τ	−4.512	−16.776 − 8.406	−2.050
	d h m	d h m	d h m
T	22 0 20	22 1 50	22 3 20
	d h m	d h m	d h m
$T+\tau$	22 0 15.488	22 1 33.224 22 1 41.594	22 3 17.950

Taking the four times just found, we make a new computation in each case. The times resulting from the new computation are—

		Greenwich Mean Time.				Local Mean Time.			
		d	h	m	s	d	h	m	s
Beginning of the eclipse .	November	22	0	15	30.2	21	18	46	4.2
Beginning of annular eclipse . . .			1	33	30.8		20	4	4.8
Ending of annular eclipse			1	41	41.5		20	12	15.5
Ending of the eclipse			3	17	57.4		21	48	31.4

The values from the last approximation of the quantities needed in computing the position angles, and the computation of these position angles, are—

	1st Contact.	2d Contact.	3d Contact.	4th Contact.
log ξ	9.94866*n*	9.88004*n*	9.86874*n*	9.65446*n*
log η	9.65193	9.73647	9.74385	9.80715
log tan C	0.29673*n*	0.14357*n*	0.12489*n*	9.84731*n*
	°	°	°	°
N	107.64	109.28	109.39	108.91
ψ	180.55	171.98	8.03	0.91
P	288.19	281.26	117.42	109.82
C	296.79	305.70	306.87	324.87
V	351.4	335.6	170.6	145.0

The quantities needed in computing the magnitude of the greatest eclipse, and the computation of that magnitude, are—

	2d Contact.	3d Contact.
log ζ	9.55064	9.58093
log Δ − log m sin $(M-N)$	7.56490	7.56347

T	$1^h\ 38^m$	l	+0.5740	$L-\Delta$	+0.5686
log ζ	9.5658	ζ tan f	+0.0017	$2L-0.5446$	+0.6000
log tan f	7.6754	L	+0.5723	D	0.948
log ζ tan f	7.2412	Δ	+0.0037	1/400 D	0.002
				Magnitude	0.95

Pages 564–567 contain the adopted mean places and annual proper motions of such stars, as bright as magnitude 6.5, as will be occulted during the year by the Moon.

Pages 568–605 contain the elements for the prediction of the times of occultations of stars and planets by the Moon during the current year. The system of coordinates employed is similar to that already described for eclipses, the fundamental plane passing through the center of the Earth, and being taken perpendicular to the line joining the star and the center of the Moon, but the cone circumscribing the Moon and star is regarded as a cylinder which intercepts the fundamental plane in a circle having the same linear diameter as the Moon.

In the columns referring to the star, those headed *Red'ns from 1919.0* give the quantities necessary to reduce the mean place of the star at the beginning of 1919 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

Under the general head, *At Conjunction in R. A.*, are five columns giving certain quantities for the moment of geocentric conjunction of the Moon and star in right ascension, as follows:

The *Greenwich Mean Time* is the moment, T, at which the two bodies are *in geocentric* conjunction in right ascension. At that moment the coordinate

x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour Angle, H*, gives the common geocentric hour-angle of the Moon and star at the same moment, expressed in sidereal time and counted from the meridian of Greenwich—positive toward the west and negative toward the east. Column Y gives the coordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the variations of x and y in one hour of mean time. The linear unit in these columns is the Earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the time of immersion and emersion of a star relative to the limb of the Moon may be computed for any part of the Earth by a method nearly the same as that already explained for computing eclipses, but somewhat more simple.

Prediction of Occultations for a given Place.—When it is desired to predict the circumstances of one or more occultations at any place, the first step will be to select them from the general list given in the Ephemeris. The conditions of visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H-\lambda$, taken without regard to sign, must be less than the semidiurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The Sun must not be much more than an hour above the horizon at the local mean time $T-\lambda$, unless the star is bright enough to be seen in the daytime.

When many occultations are to be selected, the most convenient course will be to write the value of $-\lambda$ on the bottom of a slip of paper, and in passing through the list of occultations to pause over each one for which condition (1) is fulfilled, and examine by means of the slip whether conditions (2) and (3) are also fulfilled. If either fails, the computer passes on. Sometimes it will be difficult to determine whether $H-\lambda$ or $T-\lambda$ falls within the limits; and in such cases the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

The next step will be to compute the local times of immersion and emersion from the elements, and to that end let—

T = the instant of geocentric conjunction of Moon and star in right ascension, expressed in Greenwich mean time;
H = the Greenwich west hour-angle of the two bodies at that moment;
λ = the longitude west of Greenwich;
$h_0 = H-\lambda$ = the local hour-angle of the star at the instant T;
δ = the star's declination.

The procedure for each occultation will then be as follows:—

(1) The geocentric coordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed by the formulæ and table given in connection with eclipses on page 752.

The next step will be to find the approximate instant of apparent conjunction of the Moon and star as seen from the place, and that may be deduced from the time of geocentric conjunction by the application of an approximate correction taken from DOWNES's table, printed in the volumes of the American Ephemeris for 1882 to 1899. This correction must be reckoned in mean solar hours, and will be designated by the symbol t. It will have the same sign as h_0.

When DOWNES's table is not available, the correction may be computed from the formulæ—

$$\xi_0 = \rho \cos \varphi' \sin h_0$$
$$\xi' = [9.4192]\, \rho \cos \varphi' \cos \tfrac{4}{3} h_0$$
$$t = \frac{\xi_0}{x' - \xi'}$$

By applying t to the Greenwich mean time of geocentric conjunction, as given with the elements, we shall have the Greenwich mean time of local conjunction within a few minutes.

(2) Compute for the instant $T+t$ the following quantities, in which t_0 is the sidereal equivalent of the mean time interval t:

$$\xi = \rho \cos \varphi' \sin (h_0 + t_0)$$
$$\eta = \rho \sin \varphi' \cos \delta - \rho \cos \varphi' \sin \delta \cos (h_0 + t_0) - \eta_1 - \eta_2$$
$$\xi' = [9.4192]\, \rho \cos \varphi' \cos (h_0 + t_0)$$
$$\eta' = [9.4192]\, \rho \cos \varphi' \sin \delta \sin (h_0 + t_0) - [9.4192]\, \xi \sin \delta$$
$$x = x' t$$
$$y = Y + y' t$$

Compute also m, M, n, N, and ψ from the equations—

$$m \sin M = x - \xi$$
$$m \cos M = y - \eta$$
$$n \sin N = x' - \xi'$$
$$n \cos N = y' - \eta'$$
$$\sin \psi = [0.5646]\, m \sin (M - N)$$

ψ being taken between the limits ±90°. Finally compute,

$$\tau = -\frac{[1.7782] m}{n} \cos (M - N) \mp \frac{[1.2135]}{n} \cos \psi$$
$$\delta\tau = \frac{[6.7591] \tau^2}{n \cos \psi} [\eta_2 \cos (N \mp \psi) - \xi \sin (N \mp \psi)]$$

where the double signs are to be taken negative for an immersion and positive for an emersion. Both τ and $\delta\tau$ thus have two values, which are expressed in minutes of time, and in order to distinguish them let those pertaining to immersion be designated, respectively, τ' and $\delta\tau'$, while those pertaining to emersion are designated τ'' and $\delta\tau''$. We then have for the Greenwich mean times of the phases,

Instant of immersion $= T + t + \tau' + \delta\tau'$
Instant of emersion $= T + t + \tau'' + \delta\tau''$

These expressions are practically exact, as the corrections $\delta\tau$ seldom amount to so much as 1.5 minutes, and whenever an inaccuracy of that magnitude is permissible they may be omitted. As a check upon the results it will be advisable to compute ξ, η, x, and y for the times of immersion and emersion finally obtained. If these times are correct, the quantities in question will fulfill the condition,

$$\sqrt{(x-\xi)^2 + (y-\eta)^2} = 0.2725$$

If $\log m \sin. (M-N) > 9.4354$, $\sin \psi$ will be numerically greater than unity, and no occultation is to be expected at the given place; but a very brief one may occur if the excess of the computed distance over the Moon's semidiameter happens to be within the errors of the ephemerides of the Moon and star.

The position-angle of the line from the Moon's center to the star, at the time of contact, is reckoned from the north point toward the east, and designated by the symbol P. It is computed from the formulæ—

$$P = N-\psi+\delta P \qquad \text{for immersion,}$$
$$\text{or} \qquad P = N+\psi+\delta P \pm 180^\circ \text{ for emersion,}$$

where the angles $N-\psi$ and $N+\psi$ are taken directly from the computation of $\delta\tau$, and δP is found in degrees of arc from the expression,

$$\delta P = \mp \frac{[7.3038]\tau^2}{\cos \psi} [\eta_2 \sin N + \xi \cos N]$$

In the latter formula the double sign is to be taken negative for an immersion and positive for an emersion.

The angle from the vertex, V, is also reckoned in the direction from the north toward the east, and is found from the formula

$$V = P - C$$

where C is computed from the expression,

$$\tan C = \frac{\xi + [8.2218]\tau\xi' - [4.9810]\tau^2\xi}{\eta + [8.2218]\tau\eta' + [4.9810]\tau^2\eta_2}$$

C being taken less or greater than 180°, according as the numerator is positive or negative.

The value of τ employed in the latter formula must be so taken as to correspond with the phase for which C is required.

In the volumes of the American Ephemeris for the years 1882 to 1901 instructions are given for constructing three special tables which greatly diminish the labor of computing occultations, but as these tables should contain from 4700 to 6300 quantities, and as they would apply only to the place for which they were computed, it will rarely be worth while to undertake the labor of forming them. Those who desire further information on the subject may consult any one of the volumes in question.

As an example of an isolated occultation, we will compute that of α Cancri on March 12, 1919, for Des Moines, Iowa, whose position is—

$$\varphi = +41^\circ\ 36'\ 0''$$
$$\lambda = +\ 6^h\ 14^m\ 31^s$$

and whose geocentric coordinates are—

$$\rho \sin \varphi' = 9.8198$$
$$\rho \cos \varphi' = 9.8744$$

From the elements on page 575 we have,

$$T = 18^h\ 13^m.4$$
$$H = +\ 8\ 38.6$$

and $\qquad h_0 = H - \lambda = +\ 2\ 24.1$

From the formulæ on page 758, we find the correction, t, to the Greenwich mean time of geocentric conjunction, T, to be about $+1^h\ 4^m.4$; therefore the Greenwich mean time of apparent conjunction is—

$T+t$=March $12^d\ 19^h\ 17^m.8$

α Cancri.	Apparent Declination.	G. M. T. of ☌	Hour Angle.	Y	x'	y'
	° ′	d h m	h m			
	+12 10.1	Mar. 12 18 13.4	+8 38.6	+0.5842	0.5420	−0.1768

	h m
h_0	+2 24.1
t_0	+1 4.6
h_0+t_0	+3 28.7
$\log(\rho\cos\varphi')$	9.8744
$\log\sin(h_0+t_0)$	9.8976
$\log\xi$	9.7720
$\log(\rho\sin\varphi')$	9.8198
$\log\cos\delta$	9.9901
$\log\eta_1$	9.8099
$\log(\rho\cos\varphi')$	9.8744
$\log\sin\delta$	9.3238
$\log\cos(h_0+t_0)$	9.7876
$\log\eta_2$	8.9858
η_1	+0.6455
$-\eta_2$	−0.0968
$\log(\rho\cos\varphi')$	9.8744
$\log\cos(h_0+t_0)$	9.7876
log const.	9.4192
$\log\xi$	9.7720
$\log\sin\delta$	9.3238
$\log\xi'$	9.0812
$\log\eta'$	8.5150
$\log x'$	9.7340
$\log t$	0.0306
$\log y'$	9.2475 n
$\log x$	9.7646
$\log y'\!/t$	9.2781 n

$y'\!/t$	−0.1897
Y	+0.5842
x	+0.5816
ξ	+0.5916
$x-\xi$	−0.0100
y	+0.3945
η	+0.5487
$y-\eta$	−0.1542
x'	+0.5420
ξ'	+0.1206
$x'-\xi'$	+0.4214
y'	−0.1768
η'	+0.0327
$y'-\eta'$	−0.2095
$\log m\sin M$	8.0000 n
$\log\cos M$	9.9991 n
$\log m\cos M$	9.1881 n
$\log\tan M$	8.8119
$\log n\sin N$	9.6247
$\log\sin N$	9.9520
$\log n\cos N$	9.3212 n
$\log\tan N$	0.3035 n
	° ′
M	183 43
N	116 26
$M-N$	67 17

$\log m$	9.1890
$\log n$	9.6727
log const.	0.5646
$\log m$	9.1890
$\log\sin(M-N)$	9.9649
$\log\sin\psi$	9.7185
ψ	+31° 32′
log const.	1.7782
$\log m/n$	9.5163
$\log\cos(M-N)$	9.5868
log (1)	0.8813
log const.	1.2135
colog n	0.3273
$\log\cos\psi$	9.9306
log (2)	1.4714
	m
−(1)	− 7.61
∓(2)	∓29.61
τ for immersion	−37.22
τ for emersion	+22.00

The computation of $\delta\tau$ for the two contacts is as follows:

	Immersion.	Emersion.
$N\mp\psi$	84° 54′	147° 58′
$\log\cos(N\mp\psi)$	8.9489	9.9283 n
$\log\eta_2$	8.9858	8.9858
log (1)	7.9347	8.9141 n
$\log\sin(N\mp\psi)$	9.9983	9.7246
$\log\xi$	9.7720	9.7720
log (2)	9.7703	9.4966
(1)	+0.0086	−0.0821
(2)	+0.5892	+0.3138
(1)−(2)	−0.5806	−0.3959

	Immersion.	Emersion.
log [(1)−(2)]	9.7639 n	9.5976 n
log const.	6.7591	6.7591
$\log\tau^2$	3.1414	2.6848
colog $(n\cos\psi)$	0.3967	0.3967
$\log\delta\tau$	0.0611 n	9.4382 n
	d h m	h m
$T+t$	Mar. 12 19 17.8	19 17.8
τ	−37.22	+22.00
$\delta\tau$	− 1.15	− 0.27
Greenwich M. T.,	Mar. 12 18 39.4	19 39.5
λ	+ 6 14.5	+6 14.5
Des Moines M. T.,	Mar. 12 12 24.9	13 25.0

To find δP and P:

$\log \eta_2$	8.9858	$\log \xi$	9.7720	(3)	+0.0867
$\log \sin N$	9.9520	$\log \cos N$	9.6485n	(4)	−0.2633
log (3)	8.9378	log (4)	9.4205n	(3)+(4)	−0.1766

	Immersion.	Emersion.		Immersion. °	Emersion. °
log [(3)+(4)]	9.2470n	9.2470n	δP	+ 0.6	− 0.2
log const.	7.3038n	7.3038	N	116.4	116.4
$\log r^2$	3.1414	2.6848	$\mp\psi$	−31.5	+31.5
$\text{colog} \cos \psi$	0.0694	0.0694	const.	0.0	180.0
$\log \delta P$	9.7616	9.3050n	P	85.5	327.7

Pages 606–607 contain in detail all the data necessary for observing every occultation of the general list which is visible at Washington during the current year.

Page 608 contains the *Ephemeris for Physical Observations of the Sun.*

Page 609 contains certain elements referring to the Moon, its equator, and its orbit.

i = the inclination of the Moon's mean equator to the Earth's true equator.

Δ = the distance on the Moon's mean equator from its ascending node on the Earth's true equator to its ascending node on the ecliptic of date.

☊′ = the distance along the Earth's true equator from the true equinox to the ascending node of the Moon's mean equator.

Γ' = the longitude of the perigee of the Moon's orbit, referred to the mean equinox of date.

☊ = the longitude of the ascending node of the Moon's orbit on the ecliptic, referred to the mean equinox of date.

☾ = the Moon's mean longitude, referred to the mean equinox of date.

Pages 610–617 contain the *Ephemeris for Physical Observations of the Moon.* The selenographic longitudes are measured in the plane of the Moon's equator, the axis of reference being the radius of the Moon which passes through the mean center of the visible disk positive toward the west—i. e., toward Mare Crisium—and the latitudes are measured from the Moon's equator, positive toward the north—i. e., in the hemisphere containing Mare Serenitatis.

The optical and physical librations in longitude and latitude have been computed with elements and formulæ given on page xi, and their sums are given in the second and third columns, respectively, the physical libration being given separately in the fourth and fifth columns. The Sun's selenographic colongitude (90° − longitude) and latitude and the position-angle of the Moon's axis, C, in the sixth, seventh, and eighth columns, respectively, have all been corrected for the effect of physical libration.

When the libration in longitude is positive, the mean center of the disk is displaced toward the east—that is, the region thus exposed to view is on the west limb—and when the libration in latitude is positive the mean center of the disk is displaced toward the south—that is, the region thus exposed to view is on the north limb.

The altitude of the Sun, A, at any given time above the horizon of any point on the Moon whose selenographic longitude and latitude, λ and β, are known, may be computed from the following formula, the Sun's selenographic longitude and latitude being denoted by $l_\odot$ and $b_\odot$, respectively:

$$\sin A = \sin b_\odot \sin \beta + \cos b_\odot \cos \beta \cos (l_\odot - \lambda)$$

Pages 618–619 contain the data with reference to the illuminated disks of Mercury and Venus. The angle θ is the angle which the arc of the great circle from the planet to the Sun makes with the arc from the planet toward the west, measured in the direction west, north, east, south. It is measured from 0° to 360°. We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Pages 620–621 contain the *Ephemeris for Physical Observations of Mars.* The quantities here given have been corrected for aberration, so that in using them they should be interpolated to the actual time of observation.

P – the position-angle of the axis of rotation measured eastward from the north point of the disk.
$A\oplus$, $A\odot$ – the planetocentric right ascensions of the Earth and Sun, respectively, measured in the plane of the planet's equator from its vernal equinox.
$D\oplus$, $D\odot$ – the planetocentric declinations of the Earth and Sun, respectively, referred to the planet's equator.
$\odot$ ♂ – the planetocentric longitude of the Sun measured in the plane of the planet's orbit from its vernal equinox.
k – the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.
i – the angle between the Sun and the Earh as seen from the planet.
q – the angular value of the greatest defect of illumination as seen from the Earth.
Q – the position-angle of the radius of the disk which passes through the point of greatest defect of illumination—that is, of the radius perpendicular to the line joining the cusps. It is measured eastward from the north point of the disk.

The column headed *Central Meridian* contains the longitude of the meridian which bisects the disk, measured from the adopted zero meridian.

The columns headed *Mean Time of Transit of Zero Meridian* contain the Greenwich Mean Time of every transit of the zero meridian across the actual center of the disk.

Pages 622–625 contain the *Ephemeris for Physical Observations of Jupiter.*

The columns headed *Central Meridian* contain the longitudes of the meridian which bisects the disk, measured from the adopted zero meridian of System I and System II, respectively.

The column headed *Correction for Phase* contains the corrections to be applied to the longitudes of the central meridian to obtain the longitudes of the meridian bisecting the illuminated disk.

The column headed *Transit of Zero Meridian* contains the Greenwich Mean Time of every fifth transit of the zero meridian across the center of the illuminated disk.

The quantities in the remaining columns on pages 622–625 are the same as those defined under the *Ephemeris for Physical Observations of Mars.*

Pages 626–651 contain, concerning the *Satellites of Jupiter*, the diagram of the orbits of Satellites I–V, the times of conjunction of Satellites I–IV, the times of elongation of Satellite V, the differences in right ascension and declination between Jupiter and Satellites VI and VII, and the phenomena *of the Satellites* I–IV together with their configurations.

Page 652 contains the *Magnitude of Saturn* and the *Elements of the Rings.*

a, b—the major axis and minor axis, respectively, of the outer ellipse of the outer ring.

P—the position-angle of the northern semi-minor axis of the rings, measured from the north, positive toward the east.

B—the Saturnicentric latitude of the Earth referred to the plane of the rings, positive toward the north.

$U+180°$—the Saturnicentric longitude of the Earth measured in the plane of the rings from their ascending node on the Earth's equator.

ω—the distance in the plane of the rings from their ascending node on the Earth's equator to their ascending node on the ecliptic.

B'—the Saturnicentric latitude of the Sun referred to the plane of the rings, positive toward the north.

$U'+180°$—the Saturnicentric longitude of the Sun measured in the plane of the rings from their ascending node on the ecliptic.

Pages 653–661 contain, concerning the *Satellites of Saturn*, the diagram of the orbits of the seven inner satellites, the times of elongation for the first eight satellites, the differences in right ascension and declination between Saturn and Phœbe, the ninth satellite, and tables for predicting the position-angles and distances from the center of the planet of the first eight satellites.

Page 662 contains the diagram of the orbits of the satellites of Uranus, together with the times of their elongations.

Pages 663–664 contain tables for predicting the position-angles and distances from the center of the planet of the satellites of Uranus and Neptune.

Page 665 contains the diagram of the orbit of the satellite of Neptune, together with the times of its elongations.

Pages 666–667 contain the *Phenomena*, or the configurations of the Sun, Moon, and planets, expressed in the symbols of page xviii. The predicted times of the conjunctions, quadratures, and oppositions of the planets with respect to the Sun are, respectively, the instants when the longitude of each planet differs from that of the Sun by 0°, ±90°, or 180°. For the conjunction of the planets with the Moon and with each other, the predicted times are the instants when the two bodies have the same right ascension. In the case of conjunction the degrees and minutes to the right indicate the difference of declination. Thus, ☌ ♂ ☾ . . . . ♂ $-4° 22'$ would be read "Conjunction of Mars with the Moon, Mars, 4° 22′ to the South."

These pages contain also the beginning of the seasons; the perihelia and aphelia of the planets, including the Earth; the passage of the planets through the nodes of their orbits upon the ecliptic; and the date of lunar and solar eclipses, with their aspect as seen from Washington.

Pages 668–677 contain the *Positions of Observatories*, together with a list of the authorities from which the positions are obtained. The tabular arrangement is self-explanatory.

Page 678 contains two examples in the computation of lunar distances, which are inserted because lunar distance tables are no longer published.

Pages 679–738 contain a series of tables numbered from I to X.

Table I—*For Finding the Latitude by an Observed Altitude of Polaris.*

Table II—For converting *Sidereal into Mean Solar Time.*

Table III—For converting *Mean Solar into Sidereal Time.*

Table IV—For finding the *Azimuth of Polaris at All Hour Angles.*

Table V—For finding the *Azimuth of Polaris at Elongation.*

Table VI—*For Finding the Times of Upper and Lower Culmination of Polaris.*

Table VII—For finding the *Apparent Place, Time of Upper Culmination, and Time Interval between Upper Culmination and Elongation,* of Polaris.

Table VIII—For finding the time of *Sunrise* and *Sunset* at any place between the equator and 60° north latitude.

Table IX—*Sunrise and Sunset for Southern Latitudes.*

Table X—For finding the time of *Moonrise* and *Moonset.*

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